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SUPPLEMENT TO THE BRITISH HANDBOOK ON BULGARIAN RAILWAYS

1939 - 1943.

5 May 1943

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CONTENTS

	Page
Explanatory Note	
Part One - General Aspects	1
A. Recent Changes in the Railway Network	1
B. Condition of the Permanent Way	1
C. Condition of the Rolling Stock	2
D. Present Direction and Density of Traffic	2
E. Strategic Considerations	3
Part Two - The Railway Network in 1943	5
A. Main Lines	5
B. Secondary Lines	5
C. Lines Acquired or Operated in Rumania, Yugoslavia and Greece	5
D. Lines under Construction	6
E. Projected Lines	6
F. Narrow Gauge Lines	7
Part Three - Description of New Lines	8
A. Standard Gauge Lines	8
1. Shumen - Karnobat Line	8
2. Ilientsi - Makotsevo - Sopot Line	14
a. Ilientsi - Makotsevo Line	14
b. Makotsevo - Sopot Line (Under Construction)	14
3. Mihailovo - Rakovski Line	20
4. Kurdzhali - Momchilgrad - Komotini Line	25
a. Kurdzhali - Momchilgrad Line	26
b. Momchilgrad - Polyanthos Sector (Under Construction)	26
5. Krichim - Peshtera Line	27
6. Krumovo - Asenovgrad Line	31
7. Levski - Lovech Line	32
8. Kostinbrod - Batanovtsi Line (Under Construc- tion)	32
9. Pernik - Bankya Line (Under Construction)	33

B. Narrow Gauge Lines	Page 34
1. Pazardzhik - Varvara	34
2. Saranlovo - Iztok	35

List of Maps and Diagrams

1. Map of Bulgarian Railways and Roads
2. Railway Line Capacity and Rail Weights
3. Map of the Shumen - Karnobat Line
4. a. Diagram of the IlIENTSI - Makotsevo Line
b. Map of the Makotsevo - Sopot Sector Under Construction
5. Map of the Mihailovo - Rakovski Line
6. a. Diagram of the Momchilgrad-Polyanthos Line
b. Diagram of the Rakovski-Knizhovnik Sector of the
Rakovski-Momchilgrad Line
7. Diagram of the Krichim-Poshtera Line
8. Diagram of the Levski-Lovech Line
9. Diagram of the Chopino-Yakoruda Sector of the Saranlovo-Iztok Line

EXPLANATORY NOTE

This study is not a survey of the entire Bulgarian railway system. It presents recent or supplementary data not available in previous surveys. The most complete and adequate treatment of the railway situation is given in the Handbook on Bulgarian Railways, P.L. /17.42.Tn.1(c)/497, issued by the British in July 1942. The Handbook, however, does not include technical detail on some of the newer lines covered and other lines are entirely omitted. The following report may be regarded as primarily a supplement to the British Handbook. An important part of this is a railway map, giving all stations, with the latest official names, and showing as far as possible all lines, whether completed, under construction, or projected.

The study, therefore, will be of most use to those already interested in the logistic and strategic problems involved in transportation through Bulgaria.

For the sake of uniformity descriptions of certain new lines have been given in a form similar to that in the British Handbook. In a few cases descriptive data on lines under construction has been included. Where lines do not already appear on large-scale maps their approximate routes have been shown on large-scale maps or by means of diagrams.¹

The sources include the following:

Dürzhaven Vestnik, Sofia, Vol. 62, 63 (daily)

Spisanie na dürzhavnite zheleznitsi i pristanishta v Bulgaria, Sofia, 1927-1938 (monthly)

Statisticheski godishnik na dürzhavnite zheleznitsi i pristanishta, Sofia, 1938.

Additional information on the state of the Bulgarian railways is to be found in:

1. Strategic Survey of Bulgaria, Research and Analysis Branch, OSS., Report No. 56, December 16, 1942. The section on railways includes a brief description of main lines, road bed, deficiencies, equipment, and capacity of the railway system.

2. The Locomotive Position of Axis-Dominated Europe, Research and Analysis Branch, OSS, Report No. 86, October 20, 1942, pp. 174-201. Detailed information on pre-war and present day quantity, type, condition, and performance of Bulgarian locomotives and data on repair facilities are included.

1. Place names given are those used in the latest official sources. Older names are given in parenthesis or as alternatives.

PART ONE

GENERAL ASPECTS

A. Recent changes in the Railway Network

The main deficiency of the Bulgarian railway network from a strategic point of view at the outbreak of the war (1939) was the shortage of direct international connections, particularly in a north-south direction.

The only rail connection with Yugoslavia was the Sofia-Nish-Belgrade line, with Rumania the Iovkovo-Oborishte-Chernavoda line, and with Turkey and Greece the Sofia-Pythion line. The latter was put out of commission by the Greeks in April, 1941 and political difficulties prevented its reopening for over a year.

In June 1941 the situation in regard to Rumania was improved somewhat by the establishment of a train ferry service between Ruse and Giurgiu with a capacity of 120 to 150 cars in a 10 hour day.

With the occupation of Greek and Yugoslav territory in April, 1941, immediate construction was begun on a 60 cm. narrow gauge continuation from the Bulgarian frontier station Kulata to Siderokastro (Demir Hissar) on the Salonika-Alexandropolis line. The track was laid over a roadbed used in the first World War. The line was completed in three months. It is to be converted to standard gauge. North of Kulata to Krupnik the line is narrow gauge, but it is being rapidly converted. A through standard line from Sofia to Salonika is expected by 1944.

Simultaneously work was begun on two lines to Yugoslav Macedonia. One is to connect Gjuveshevo with Kumanovo, and the other will connect Gorna Dzhumaja with Kochane. An extension of the Rakovski-Momchilgrad line south to Komotino (Giumiurdzhina) in Greece was also begun.

All of these projects involve the construction of long tunnels and other engineering works, and probably can not be completed before 1944. The railway situation in Bulgarian and occupied territory from the point of view of international connections is therefore not essentially different from its pre-war state.

The only important addition to the internal network since 1939 is the Shumen-Karnobat line which forms the third and relatively most practical link between North and South Bulgaria. The most important construction work at the present time is the double tracking of portions of the Sofia-Pernik line which will increase the capacity of this vital coal hauling line from twenty to over forty trains a day in each direction. A second line under construction between Kostinbrod and Batanovtsi will permit military movements to by-pass the busy Sofia-Pernik line. Both were due to be completed by 1943, but it is now reliably reported that a short connection between Pernik and Bankya has been given priority. It will serve the same purpose.

B. Condition of the Permanent Way

In general, Bulgarian lines are in poor condition. Heavy rails (41 kg/m) have been laid on the main line through northern Bulgaria and on most of the Sofia-Plovdiv line, but all other lines can carry a maximum axle load of only 14 to 16 tons. Insufficient ballast and sleepers, weak bridges, and above all, steep gradients and sharp curves reduce capacity and speed of traffic to less than thirty miles per hour.

What little in the way of German railway materials has reached Bulgaria has gone into new construction rather than maintenance and repair. Maintenance work on militarily important lines is being done under German technical supervision, but it probably does not do more than equalize the added strain of military traffic.

Damage by sabotage has been slight except in occupied Bulgarian territory.

C. Condition of the Rolling Stock

Locomotives - Bulgaria is believed to be operating between 570 and 600 standard gauge locomotives, about 100 of which (mostly second-hand) have been acquired since the war began. Heavy demands on the locomotives, coupled with the fact that nothing but minor repairs were undertaken between 1939 and 1942 has caused considerable deterioration of an already poor locomotive supply.

A proposed plan for keeping locomotives in almost constant service will further worsen the situation. If it should come to military operations in the Balkans, however, locomotives from Germany's military pool could be drawn upon.

D. Present direction and Density of Traffic Flow

The pre-war character and volume of domestic railway freight traffic, which consisted primarily of food movements out of the central and northern plains and a compensating movement of lumber, coal and tobacco from the mountainous areas to the plains, (both of which were heaviest during the fall) have not been significantly altered.

The changes are primarily the following: drastic reduction in passenger traffic, at times up to 50%; flow of freight and troop traffic over and above domestic requirements, determined by Axis military needs.

The latter exceeds the reduction in passenger traffic and places a heavy strain on rolling stock and marshalling facilities. Germany is compelled to send its own cars for much of this added traffic. Its main directions in 1942 were:

1. A general movement of foodstuffs to the Danube ports, the Sofia-Nish line and Salonika for export to Germany or use by German troops in Russia and Greece (North Africa). This traffic was heaviest in October and November, 1942.
2. Movement of military supplies and goods from Axis Europe to concentration points including those in the Maritsa valley and around Sofia, Skopi and Salonika.
3. Movement of oil from Rumania to Greek ports via the Ruse-Sofia-Nish-Salonika line, and more recently over the Ruse-Stara Zagora-Pythion-Dedeagach (Alexandropolis) -Salonika line. Purely military oil traffic was reported to have reached a rate of about fifty tank cars a day in October, 1942.

4. Movement of German troops and material from Russia (sporadic) or from replacement centers in Slovakia and Poland over the same routes and over the Belgrade-Prishtina-Skopie line. Troop trains averaged about two a day, and supply trains five or six a day during 1942.

E. Strategic Considerations

1. The role of Bulgarian operated railways in case of a United Nations' attack on Greece:

All rail-borne supplies to German armies in Greece must come either by way of the Belgrade-Skopie-Salonika route or by the Sofia-Krupnik-Demir Hissar route. A third route, by way of Svilengrad and Dedeagach (Alexandropolis) might be strategically dangerous from the Axis point of view unless Turkey were completely won over or defeated by Germany.

The volume of the rail traffic that can reach the Salonika area is limited to 8,500 to 10,000 tons daily by the capacity of the Skopie-Veles sector of the Belgrade-Salonika line and of the narrow gauge Krupnik-Demir Hissar sector of the Sofia Salonika railway route. The estimated military capacity of the Skopie-Veles sector is about twenty-four forty car trains in each direction, each carrying 300-350 tons of military stores. Sabotage along this line has been considerable. The narrow gauge line to Demir Hissar has a capacity of only ten trains a day, each carrying 150 tons of military stores. This line is being rapidly converted to standard gauge and when completed will carry about 18 trains carrying 300-350 tons each per day. This would raise the total military deliveries at Salonika to 12,500 to 14,500 tons per day. The estimated capacity of the Svilengrad Pythion - Salonika line, if it could be used, would be between ten and eighteen 300 tons trains daily in each direction. To Komotini (Giannurdzhina) from Salonika, the capacity is eighteen pairs of trains.

2. The role of Bulgarian operated railways in the event of an Axis attack on, or defence of the Turko - Bulgarian frontier:

Land operations against Turkey would involve use of four strategic railway points within twenty-five miles of the frontier. They are Dedeagach (Alexandropolis), Momchilgrad, Zlati-dol and Elhovo. The lines from Dedeagach and Zlati-dol run to the Turkish frontier at Pythion and Svilengrad and a new rail extension from Elhovo toward the frontier is reported.

The approximate daily arrival at these four railheads is indicated in the table below. It is assumed that supplies would be drawn from stocks in the Yambol, Plovdiv and Haskovo military zones as well as from outside the country. The shortage of coal in southern Bulgaria as well as of rolling stock would tend to make the schedule below the maximum capacity.

	No. of Trains	Cars per Train	Tons of mil- itary Stores (Approx.)	Tons per Train
Dedeagach or Pythion	20	40	6,000	300
Zlati-dol* or Harmanli	30	45	10,500	350
Momchilgrad	15	33	3,750	250
Elhovo	12	35	3,300	275
Totals	77	38(average)	23,550	300(approx.)

* By running trains around the Zlati-dol Nova Zagora-Mihailovo-Rakovski rectangle in one direction, the number of trains could be increased by at least ten.

PART TWO

THE RAILWAY NETWORK IN 1943

A. Main Lines

At the beginning of 1943, the Bulgarian railway network, within the boundaries of 1939, comprised the following main, standard gauge lines:

Dragoman (Frontier)	Svilengrad (Frontier)	359.6 km.
Sofia	Varna	541.5 km.
Ruse	Stara Zagora	262.5 km.
Plovdiv	Burgas	293.9 km.
Sofia	Krupnik	147.2 km.
Mezdra	Lom (port)	118.3 km.
Radomir	Kiustendil	54.7 km.
Iovkovo	Oborishte (Frontier)	51.4 km.
Ruse	Kaspichan	140.1 km.
Shumen	Karnobat	133.0 km.

B. Secondary Lines

The following secondary standard gauge lines were in operation in January 1943.

Voluyak	Bankya	10.9 km.
Sofia belt line		23.5 km.
IlIENTSI	Makotsevo	45.9 km.
Krumovo	Asenovgrad	10.1 km.
Zlatidol	Nova Zagora	62.3 km.
Yasen	Somovit-Nikopol	46.7 km.
Svishtov	Lovech (including Oresh-Belene spur)	107.4 km.
Gorna Orehovitsa	Leskovets	6.4 km.
Sindel	Staro Orehovo	28.4 km.
Filipovo (Plovdiv)	Karlovo (with branch Dolna-Mahala-Hisar)	76.0 km.
Yambol	Elhovo	43.1 km.
Zimnitsa	Dubovo	93.2 km.
Tulovo	Sopot	79.8 km.
Tsareva Livada	Gabrovo	17.2 km.
*Mihailovo	Momchilgrad	133.1 km.
Boichinovtsi	Berkovitsa	36.2 km.
Brusartsi	Vidin	86.7 km.
Kiustendil	Giueshevo	33.7 km.
*Krichim	Peshtera	28.3 km.
Burgas	Pomorie	25.0 km.
Tsar Krum	Preslav	7.0 km.

* Detailed descriptions of all lines marked with asterisks contained in Part III

"u" is pronounced as the u in "under" or "Bulgaria"

C. Lines Acquired or Operated in Greece, Rumania and Yugoslavia

1. Through the Rumanian cession of southern Dobrudja in September 1940 the Iovkovo - Oborishte main line was extended by 70 km to Harman (frontier), and through the occupation of south east Serbia in May, 1941 the Dragoman Slivnitsa line was extended 54 km from Dragoman to Chiflik (frontier).

2. Main standard gauge lines acquired through the occupation of former Greek and Yugoslav territory, not connected directly with the Bulgarian network are the following:

(20838)

Gurdelitsa (frontier) - Gevgeli (frontier)	323 km.
Predel (Gurlitsa) - Skopje	45 km.
Rodopolis (Poroi) (frontier) - Dedesagach	321 km.

(Pythion - Svilengrad operated by Turks)

In addition, the Bulgarian railways are believed to have been right to exploit the following lines in Greece:

Salonika - Gevgeli (frontier)	77 km.
Salonika - Rodopolis (frontier)	120 km.
Dedesagach - Pythion (German occupation zone)	107 km.

Joint responsibility with the Serbian state Railways is believed to be held over the Chiflik (frontier) - Nish and Nish-Gurdelitsa (frontier) main lines.

3. Secondary standard gauge lines in occupied Yugoslavia are:

Veles - Kremenitsa (frontier)	148 km.
Veles - Kochani	87 km.

D. Lines under Construction in 1943

Krupnik - Demir Hissar <u>1/</u> (branch to Petrich)	110 km.
Giueshevo - Kumanovo	110 km.
Gorna Dzhumaja - Kochani	105 km.
*Makotsevo - Sopot	100 km.
Murna - Sindel	55 km.
Monchilgrad - Poljanthos	95 km.
Batanovtsi - Kostinbrod	39 km.
Sofia - Pernik (double tracking)	33 km.
Dupnitsa - Bobov Dol	25 km.
Pernik - Bankya	(approx.) 20 km.

Temporarily held up:

Popovo - Razgrad - Isperih
 Lovech - Troyan
 Preslav - Vurbitsa
 Leskovets - Elena

E. Projected Normal Gauge Lines:

Burgas - Elhovo - Gulabovo 2/
 Poduene (Sofia) - Samokov - Belitsa - Paramestion (Greece)
 Kostenets - Samokov - Dupnitsa
 Dolna Kamartsi - Botevgrad - Yablanitsa - Sevlievo - Tirnovo - Turgovishte
 Levski - Trumbesh
 Isperih - Silistra 2/
 Asenovgrad - Ustovo - Monchilgrad
 Batanovtsi - Breznik - Trun
 Troyan - Kurnare (W of Karlovo) 2/
 Boichinovtsi - Kozlodui
 Vidin - Kula
 Pleven - Lovech
 Kurdzhali - Ivailovgrad
 Drenovets - Chiflik - Stakiovtsi

1/ In converting this line from narrow gauge to standard, the old road-bed is used only in some places.

2/ These probably will have priority rating.

Yasen - Boichinovtsi
Panagiurishte - Pirdop
Peshtera - Batak
Polyanthos - Porto Lagos 1/

F. Narrow Gauge Network, January, 1943

1. 76 cm. gauge.

Cherven Breg - Orehovo	104.1 km.
Saranovo - Istok - Bansko	(approx.) 113.0 km.
Pazardzhik - Varvara	16.6 km.

Under construction are the lines:

Cherven Breg - Teteven
Bansko - Izvorite (Simitliif)

Projected are:

Malko Tirnovo - Tsarevo
Bansko - Nevrokop

2. 60 cm. gauge

Krupnik - Demir Hissar (Siderokastro)	110.0 km.
Dupnitsa-Bobov Dol	25.6 km.
Kocherinovo - Orlitsa <u>2/</u>	15.8 km.
Kaspichan - Kraina (Branch to Bozhidar)	56.8 km.
Burgas - Pomorie (Branch to Rudnik)	19.4 km.
General Todorov - Petrich	9.3 km.
Glumchin (Mara Buneva) - Skopie (from Yugoslavia)	30 km.

Projected: General Todorov - Vetren

1/ These probably will have priority rating.

2/ A private 60 cm gauge line continues 25 km to the Rila Monastery.

PART THREE

DESCRIPTION OF NEW LINES

A. Standard Gauge Lines1. Shumen-Karnobat Line^{1/}a. History and Characteristics

First planned in 1895 this line was begun in 1916 and completed from Karnobat to Lozarevo (Komarevo) (18 km.). Between 1925 and 1934 a large part of the Shumen-Smedovo line was completed. In 1936 the original direct route between Smedovo and Zaicher (Kazaluk) was abandoned in favor of a curve to the east down the Golema Kamchia and up the Luda Kamchia rivers. The complete new route is 133 km. long.

Work on the new route was carried on intensively in 1938, 1939, and 1940. It was opened in 1941 and has the following general characteristics:

61%	of the line has gradients from 0 to 2.5 0/00. (metres per
35%	" " " " " " " 2.5 to 10.0 0/00. (thousand
4%	" " " " " " " 10.0% to 12. 0/00. (meters or
	(.25 per cent)

49%	" " " " is straight.
18%	" " " " has curves with radii over 500 m.
33%	" " " " " " " " between 400 and 500 m.

The maximum gradients of 12 0/000 are on the Karnobat-Zaicher (Kazaluk) and Smedovo-Shumen sectors, while the minimum curve radii of 400 m. are on the Smedovo-Zaicher sector.

Because of its small grades and large radii, the line is inexpensive to exploit and causes little wear and tear on locomotives and roadbed. Higher speeds are possible than on most Bulgarian lines. More difficulty has been encountered with landslides than originally expected.

There are only three small tunnels (240, 230 and 80 m.) and one large and three medium sized steel bridges. The "virtual coefficient" of the line is 1.80 (relation of exploitation cost of the actual line to the ideal line).

The maximum capacity is 35 pairs of 500 metric ton trains every 24 hours. Only one locomotive is required for each train.

b. Significance:

The Shumen-Karnobat line is one of three lines crossing the Balkan mountains and the only one connecting northern and southern Bulgaria in the eastern part of the country. The Stara-Zagora-Gorna Orekhovitsa line, 120 km. to the W. has too many steep gradients, sharp curves and short station areas to be of large economic significance. The new line is expected to carry the bulk of the heavy N-S freight traffic as well as much of the passenger traffic.

^{1/} Spisanie na dŕzhavnite zheleznitsi i pristanishta v Bulgariya, Sofia, June, 1937, pp. 220-225; also Railway Gazette, August 1, 1941, p. 118.

The Shumen-Karnobat connection has had the following effect on railway distances:

1. The distance between Varna and Burgas is shortened from 545 km. to 298 km. When the line connecting the Shumen-Karnobat line at Murna with the Sofia-Varna line at Sindel is completed, the Varna-Burgas distance will be cut another 84 km. to 214 km.
2. When the Sofia-Kazanlık "Sub-Balkan" line is completed, the distance Sofia-Varna via Karnobat and the new Murna-Sindel connection will be 40 "actual" km. and many more "virtual" kilometers shorter than the present route via Pleven and Gorna-Orehovitsa.
3. The new line makes possible more rapid train communications between Poland, the U.S.S.R. and Rumania, and Istanbul either via the ferryboat at Ruse or the Cherna Voda bridge. When the Yambol-Elhovo line is eventually continued S to Edirne, the route to the Near East will be even shorter.
4. The primary wartime importance of the Shumen-Varna line is that it eliminates to a considerable extent the bottlenecks formed by the Sofia-Mezdra and Stara Zagora-Gorna Orehovitsa lines for military movements N and S across the mountains. Its favorable profile permits the rapid passage of a large number of trains with a minimum of locomotives and fuel.

c. List of Stations 1/

			<u>Old Name</u>
Km.	0.000	Shumen	Shumna
"	8.000	Dibich (stop)	Kasaplar
"	14.000	Radko Dimitriev (stop)	Nasturle*
"	21.500	Zlokuchane	Kiupriu-kioi
"	28.000	Smedovo	Smedovo
"	33.000	Bel Breg	Akir
"	37.000	Zhelud (stop)	Kazul-pelit
"	41.000	Arkovna (stop)	Redzheb-Mahle
"	46.000	Ganchovo (stop)	Ganchevo (Prezhda)
"	50.000	Murna	Delikioi
"	55.000	Kamchia (near Asparuhovo)	Chenge
		(stop)	
"	61.000	Manastirets (stop)	Hadzhi Mahlesi
"	66.000	Turnak	Tikenlik
"	70.000	Kara Veliovo (stop)	Kara Veliler
"	74.500	Duskotna	Duskotna
"	81.000	Listets (stop)	Karalar
"	86.000	Liuliakovo (stop)	Kirititlik
"	90.500	Zavet	Barik
"	97.000	Zaichar (stop)	Enimahle (Kazaluk)
"	104.000	Peter Beron (near Prilep)	Dobrol
"	109.500	Podvis	Podvis
"	115.500	Lozarevo	Eni-kioi (komarevo)
"	123.000	Vulchin (stop)	Kurt-kodzha
"	133.000	Karnobat	Karnabat

d. Vulnerable Points

Engineering Works There are two longer bridges (30-60 m) and three tunnels of 240, 230 and 80 m. respectively on the Shumen-Karnobat line. Their location is as follows:

Steel Bridge One or two spans with stone masonry pylons, about 50 m. long over Golema Kamchia river at Zlokuchane, about 21,500 km. S of Shumen.

Tunnel 240 m. long between Kamchia and Manastirets (about 1 km. N of Manastirets).

Tunnel 230 m. long between Kara Veliovo and Duskotna (about 2 km. N of Duskotan).

Bridge over Iuda Kamchia between Zavet and Zaichar. Probably one or two steel spans and stone masonry supports with a total length of about 40 m. About 3 km. W of Zavet.

Trestle and Bridge over Azmak river depression, 2 km. N W of Karnobat station. Trestle is 650 m. long and about 10 m. high. Bridge is probably steel and about 20 m. long.

1/ Dürzhaven Vestnik, Nov. 15, 1941

* u is pronounced as the u in Bulgaria.

e. Station Facilities.

Engine shed, marshalling yard and water tower at Shumen. Marshalling yards and probably a new engine shed at Karnobat.

All station areas are above the accepted minimum length of 600 m. The distance between entrance and exit switches is 450 to 600 m. and can be expanded.

f. General Details

1. Gauge: 1,435 mm.
2. Length: 133 kms.
3. Track: Single track throughout.
4. Permanent Way: Steel rails 31 and/or 35 kg.; wooden sleepers.
5. Maximum Permissible Axle Load: 17 tons.
6. Gradients: Maximum gradient 12 0/00 between Karnobat and Zaichar; 10 0/00 between Zaichar and Shumen. 61% of the line has gradients from 0 to 2.5 0/00, 35% has 2.5 to 10 0/00 gradients and 4% has 10 to 12 0/00 gradients.
7. Curvature: 400 m. (minimum). 49% of the line is straight.
8. Engineering Works: About 22 bridges (2 over 30 m); 3 tunnels (240 m., 230 m., 80 m.).
9. Traction: Steam.
10. Maximum Distance Between Stations: 10 km. (Karnobat-Vulchin).
11. Capacity: 35 trains of 500 metric tons in each direction a day (24 hrs). Only one locomotive required per train.
12. Journey time: Under 4 hours for stopping train.
13. Engine Sheds: Shumen, Karnobat.
14. Marshalling Yards: Shumen, Karnobat, and possibly Marna where connecting line to Varna is being built.
15. Watering Facilities: Shumen, Karnobat and possibly Smedovo, Marna, Duskotna or Zavet.

Note: In the subsequent route descriptions the following abbreviations are used:

J Junction
E.S. Engine Shed
M Y Marshalling Yard
W Water Tower
W B Weigh Bridge

g. Description of the Line

(Shumen-Karnobat)

KM.	Altitude (m)	Stations	Engineering Works	Remarks
0	194	Shumen		ES; MY; W; J with Sofia-Varna line.
8	130*	Dibich		Line runs 3 km. ESE, then 5 km. S.E. to Dibich, then S to Radko Dimitriev, along the left (E) bank of the Bokludzha Dere river. Line continues S.
14	120*	Radko Dimitriev		
21	97		<u>Bridge</u> over Kamchia	About 50 m.; steel.
21.5	98	Zlokuchane		Railroad crosses Shumen-Aitos highway; continues S 6.5 km. to Smedovo. Line follows right bank of Golema Kamchia river.
24.7	105*		<u>Small bridge</u>	
25.2			<u>Bridge</u> over Zlata r.	20 m. (approx.)
28.	108*	Smedovo		Line turns E.
31.2			<u>Bridge</u> and Trestle over Bairam-dere gorge	
33		Bel Breg		Line runs on embankment; continues E along right (s) bank of the Golema Kamchia river, paralleling Shumen-Aitos highway.
37		Zhulad		
41.5		Arkovna	<u>Bridge</u> over Ladnaluk-dere r.	Line turns ESE 4.5 km. to Arkova where it turns SE and leaves the Golema Kamchia valley along the right (e) bank of Ladnalukdere river.
46		Ganchovo		(Indicated as Predzha on some maps).
50		Murna		Junction point for line connecting at Dubovino with the Sindel--Staro Orekhovo branch line is between Ganchovo and Murna. Probably under construction.
55	116	Kamchia		Line turns S and crosses watershed between Golema Kamchia and Luda Kamchia rivers at Kamchia station. Line turns SW along left (N) bank of Luda Kamchia river and continues climbing.

(Shumen-Karnobat)

KM.	Altitude (m)	Stations	Engineering Works	Remarks
59.5			<u>Tunnel</u>	240 m. Beginning of landslide danger area. Line runs through a gorge with steep sides. Landslides caused closing of the line in 1941.
61		Manastirets		
66		Turnak		Line continues SW
70		Kara Veliovo		Line turns sharply SE and crosses 30 to 50 m. bridge, continuing on right bank.
71	125		<u>Bridge over Luda Kamchia</u>	
72			<u>Tunnel</u>	230 m. Line turns S to Duskotna
74.5		Duskotna		Line turns W 3 km. then 3.5 km. WSW to Listets.
81		Listets	<u>Bridge</u>	Over gully. Line turns W.
83.5	140		<u>Bridge over Luda Kamchia</u>	30 to 50 m. Line curves S past Liuliakovo station, then curves W. following left (N) bank of river.
86		Liuliakovo	<u>Bridge over gully</u>	
90.5		Zavet		Line continues W. End of landslide area.
93.7	175		<u>Bridge over Luda Kamchia</u>	20-50-m. Line turns W by S
97		Zaicher		Line runs W by S on right (S) bank of a tributary to Peter Beron, station for Prilep Village, climbing steadily.
104		Peter Beron		Line crosses Karnobat-Shumen road and runs E to Podivs. Gradients up to 12 0/00.
109.5	341	Podvis		Watershed. Line turns S 4 km. then SE descending into Karnobat valley. Grades up to 12 0/00.
115.5	210*	Lozarevo	<u>Small bridge</u>	Line turns S 3 km. then SW.
123	180	Vulchin		Line continues SW to Karnobat. Level country.
131	165		<u>Bridges and trestle</u>	600 m. trestle over swampy river bed.
133	170*	Karnobat		ES; MY; W; J. with Plovdiv-Burgas line.

* Approximate elevations.

(20838)

2. IlIENTSI-Makotsevo-Sopot Line (Makotsevo-Sopot Sector Under Construction)

IlIENTSI-Makotsevo Sector

a. History and Characteristics

The IlIENTSI-Makotsevo line is the western most portion of the main standard gauge line which is to be the shortest connection between Sofia and Burgas (423 km) by way of the narrow central valley between the Balkan and the Sredna Gora mountains. It is often referred to as the "sub-Balkan" line. The last link, between Makotsevo and Sopot (approx. 100 km.) is now under intensive construction and may be finished in 1944. The Sopot-Zimnitsa-Burgas section of the line is covered in the British "Handbook."

Final plans for the "Sub-Balkan" line were drawn up in 1924 and work on the IlIENTSI-Makotsevo sector was begun in 1925. The bulk of the work was done between 1928 and 1931, and the line was opened on December 6, 1931.

The terrain is flat and marshy for 15 km. from IlIENTSI and becomes gradually more hilly as it enters the valley between the Balkan and Sredna Gora mountains. The countryside is largely bare. There are several high embankments and a few small cuts.

The maximum distances between stations are 19.020 and 15.690 km. but there are many stops which could be expanded to stations. There are 79 bridges and culverts. Eight of the bridges are over 10 meters in length and include a 100 m and a 75 m steel bridge.

Until the stretch east of Makotsevo to Sopot is completed, the line will only be of secondary importance. The lime from the Makotsevo deposits and building stone from Sarantsi are the main items of freight traffic. A few coal and metal ore deposits and a small lumber industry are also served.

List of Stations

km.	Name of Station	Classification	Distance to Next Station or Stop	Elevation in meters
0.000	IlIENTSI	Station	5.900 km	521.25
5.900	Svetovrachane	Stop	5.150 "	510.00
11.050	Lokorsko-Chepnitsi	Stop	4.640 "	534.14
15.690	Kremikovtsi	Station	2.870 "	555.50
18.560	Botunets	Stop	3.304 "	573.20
21.080	Yana	Station	7.471 "	577.00
28.550	Stolnik	Stop	5.910 "	586.30
33.460	Gorna Malina	Stop	3.917 "	584.00
37.370	Negushevo	Stop	2.700 "	594.60
40.100	Sarantsi	Station	4.950 "	608.50
45.050	Makotsevo	Station	--	646.00

b. Vulnerable Points

Engineering Works. The Sofia-Makotsevo line has only six important engineering works, all of them bridges. The two longest are between IlIENTSI and Svetovrachane at the west end of the line and the rest are between Stolnik and Makotsevo, at the east end of the line.

Steel Bridge. 100 m, over the main Isker channel at km 4.220 from the Ilentsi junction with the Sofia-Varna line. Four spans, 25 m. each, simple truss construction with masonry piers.

Steel Bridge. 75 m, over the Start Isker, 500 m east of the bridge above. Three spans of 25 m each, also simple truss construction.

Steel Bridge. Approximately 30 m, over the Margash river, immediately west of Stolnik village. One span of simple truss construction.

Stone Arch Bridge. Approximately 20 m, over the Negushevo river, 1 km northwest of Gorna Malina station. Two main arches, 6 m each and two side arches. Height about 10 m. Embankments at both approaches.

Steel Bridge. Approximately 20 m over the Negushevo river immediately west of Negushevo station. Simple truss construction.

Stone Arch Bridge. About 30 m, over the Makotsevo river south of the village and west of the station. The bridge has four arches and is approached from the east on an embankment.

c. General Details

1. Gauge: 1.435 m.
2. a. Length of Line: 45.050 km.
b. Length of Track: 51.570 km.
3. Track: Single track.
4. Permanent Way: Old steel rails, forty-four years old in 1943, taken from the Sofia Varna line and weighing 31 kg per lineal meter (type R.P.Sh.). Oak sleepers. The ballast is 35 cm. thick.
5. Maximum Permissible Axle Load: 14 tons. (Wartime 15 tons).
6. Gradients: Maximum: 15 ‰. Used only in the direction of Makotsevo. 20.785 km. are horizontal. Double hauling is not necessary.
7. Curvature: The minimum radius is 250 m, used only at one place between km. 44 and km. 45. 33.040 km. are straight.
8. Engineering Works: 8 bridges over 10 m. in length of which one is 100 m, one 75 m, two 30 m and two 20 m. There are 71 bridges and culverts under 1 m.
9. Traction: Steam using lignite coal from Pernik.
10. Maximum Distance between Stops: 7.471 km. (Yana-Stolnik).
11. Capacity: 8 trains a day in each direction. (Normally not more than 4 operate each way).
12. Journey Time: Ilentsi-Makotsevo, 2 hours for stopping train. Sofia-Makotsevo, 2 hrs. 15 min. for stopping train. Both times are given for mixed trains which now operate on the line. Journey time for a fast train when the line is completed beyond Makotsevo will probably be one hour.
13. Engine Sheds: None at present. Sofia facilities used. A large railway lubricating oil tank has been built at Makotsevo.
14. Marshalling Yards: None
15. Watering Facilities: Makotsevo, Sofia

d. Description of Line

KM.	Altitude (m)	Stations	Engineering Works	Remarks
0.000	521.25	Ilientsi		Station on west side of Sofia Varna line. Malotsevo line trails to the north east.
4.220	508.00		Bridge over Isker. 100 m.	Bridge has 4 spans of 25 m. Steel. Simple truss.
4.530	508.00		Bridge over Star Isker. 75 m.	3 spans of 25 m. Low marshy ground often flooded. Line turns east.
5.900	510.00	Svetovrachane (stop)	Station on left	Line turn ESE along the southern slope of the Balkan range. Country is bare. Line rises steadily.
11.050	534.14	Lokorsko Chepnitsi (stop)	Station on right	
15.300	555.00			Line crosses Kremikovtsi highway.
15.690	555.50	Kremikovtsi	Station on right	
18.560	573.20	Botunets (stop)	Station on left.	
21.080	577.00	Yana	Station on right	
22.000	c.580			Line turns sharply to SSE approaching to within 1 km of the main Sofia-Karlovo highway.
23.500	c.583			Line turns E paralleling the main highway to Stolnik station.
28.000	585	Stolnik	Bridge 30 m (approx) over Margash river	Steel, simple truss bridge.
28.550	586.30	Stolnik (stop)	Station on right.	Line turns SE, crossing the main highway at km 30.
30.000	585.00			Line turns E paralleling highway to Gorna Malina station.
33.460	584.00	Gorna Malina (stop)	Station on right.	Line turns NE crossing highway at km. 34.100
34.300	585.00		Bridge, 20. m., over Negushovo river.	Stone arch bridge with 4 spans. Line turns ENE passing through a narrow valley keeping on the south side of the river.
36.900	593.00		Bridge 20 m; over Negushovo river.	Steel, simple truss bridge. One span. Line turns SE

KM.	Altitude (m)	Stations Engineering Works	Remarks
37.370	594.60	Negush-evo (stop)	Line enters the small Sarantsi plain and crosses the main highway immediately SE of the station then turns E paralleling the road to km 40.
40.100	608.50	Sarantsi Station on right	Line turns SE to Makotsevo entering the narrow valley of the Makotsevo river.
44.500	644.00	Bridge 30 m.; over Makotsevo river	A high embankment on the eastern approach. Bridge is immediately south of the Makotsevo village. Line turns east.
45.050	646.00	Makotsevo Station on right	Building is against the side of a steep hill. Station area built up. Present end of the line.

e. Notes on the Makotsevo-Sopot Sector

The 100 km Makotsevo-Sopot link now under construction is the most difficult on the whole line. Two short mountain spurs which connect the Balkan and Sredna Gora Mountains have to be crossed. The first "Gulubets", lies between Makotsevo and Pirdop, and the second, "Koznitsa", is between Pirdop and Klisura. Between them is the relatively high Zlatitsa plain. The present roadbed provides for a 2,134 m. tunnel under the "Gulubets" mountain at a divide called "Opor" and a 5,813 m tunnel under "Koznitsa", immediately west of Klisura.

In the Sofia-Burgas direction the maximum grade is 17 0/00 while in the opposite direction there are two short sectors with a 25 0/00 grade. These are the 5.70 km ascent from Smolsko village to the "Gulubets" tunnel, and the 11.800 km ascent from Bozhidar (Rahmanliare) village past Klisura to the "Koznitsa" tunnel. Since these steep grades are concentrated in two short sectors, they will not seriously affect the exploitation of the line. Double hauling will only be necessary in those sectors in the direction of Sofia.

(1) List of Stations 1/

Kilometer	Probable Station Name	Probable Classification
*45.050	*Makotsevo	*Station
51.500	Gulubets	*Station
59.000	*Smolsko	*Station
65.000	Petrich-Benkovski	Stop
70.500	Mirko	Station
78.500	Chelopech	Stop
84.500	*Zlatitsa	*Station
89.500	*Pirdop	*Station
95.500	Dushantsi	Stop
*104.531	*Koznitsa	*Station
110.000		*Station (may be only passing loop)

1/ Station names, classification and distances not marked with an asterisk are based on fragmentary evidence and may be subject to revision.

Kilometer	Probable Station Name	Probable Classification
114.000	*Klisura	Station
*123.370	*Bozhidar (Rahmanlare)	*Station
127.500	Hristo Danov (Tekiya)	Stop
132.500	Kurnare	Station
137.500	Iganovo	Stop
*144.870	*Sopot	*Station

(2) Descriptive Notes

According to available evidence the route of this line will be approximately as follows:

1. From Makotsevo station (km 45.050 from Ilientsi) the line follows the south (left) bank of the Makotsevo river in an easterly direction climbing steadily. The valley is very narrow and the line winds sharply.
2. At about km 48.300 the line turns S.E. entering the 2.134 km tunnel through Gulubets mountain. The tunnel passes under "Opor" peak.
3. At km 51.500 there is probably a small station called Gulubets where engines used in double hauling from Smolsko can be detached.
4. From Gulubets the line drops sharply down the valley of the Smolsko river, staying on the south (right) bank, to Smolsko station. The maximum gradient of 25 0/00 is used over 5.170 km between the two stations and double hauling in the direction of Sofia is necessary.
5. Southeast of Smolsko the line turns NE crossing the Smolsko river and Bunovska river. At km 65.000 it reaches Petrich-Bankovski station and continues north staying on the east (left) bank of the Bunovska river to Mirkovo station, climbing steadily.
6. Near Mirkovo station (approx. km 70.500) the line crosses the main Sofia-Karlovo highway and turns ENE probably through a tunnel, into the Zlatitsa plain crossing numerous tributaries of the Topolnitsa river. Floods and washouts are frequent in this area. At about km. 78.500 is Chelopech Station. There is indication that the line from Makotsevo to Mirkovo was completed in 1942.
7. From Chelopech station the line continues ENE across the Buri-dere river passing Zlatitsa station (km 84.500) south of the town. Making an arc around the north side of Pirdop city the line turns ESE to Pirdop station (km 89.500). One source indicates the line as passing north of Zlatitsa as well.
8. At Pirdop station the line turns east, crossing many streams and at Dushantsi (km 95.500) approaches the Topolnitsa river.
9. The line stays on the north (left) bank of the Topolnitsa climbing toward the Koznitsa watershed. At about km 102 it crosses the river and approaches Koznitsa station at km. 104.531.
10. A few hundred meters beyond the station the line enters the 5.813 km tunnel which runs in a SE direction, curving until it comes out running in an easterly or north easterly direction.
11. At the east entrance to the tunnel there is probably a small station (km 110). The line makes a sharp arc to the north and descends sharply along the south (right) bank of the Stara Reka river in an ESE direction to the town of Klisura. There are probably several small tunnels in this sector. The city is on a hill high above the river.

(20838)

12. The line continues to drop swiftly beyond Klisura and crossing the Stara Reka river it runs through a narrow valley parallel to the river to Bozhidar station (km 123.370). Between Bozhidar and the Krustets watershed tunnel the maximum gradient of 25 0/00 is used over an 11.800 km. stretch. Double hauling is necessary in the direction of Sofia. Before Bozhidar the Strema river is crossed.

13. East of Bozhidar the line enters the narrow western end of the Karlovo valley and describes an arc to the north past Hristo Danov (Tikiya) station (km 127.500). The line keeps on the southern slope of the Balkan range.

14. From Hristo Danov the lines run in an ESE direction following the contour lines of the mountain. At km. 132.500 it passes Kurnare station, at km. 137.500 Iganovo station and at km. 144.870 it reaches Sopot. High mountains rise steeply N of the tracks. The line remains about 2.5 km. N of the Strema river.

Beyond Sopot and through to Burgas the "Sub Balkan" line is already in operation. The total distance from Sofia to Burgas along this route is 423.226 km.

3. Mihailovo-Rakovski Line.

a. History and Characteristics

The Mihailovo - Rakovski line forms part of the north-south trunk line Ruse - Stara Zagora - Rakovski - Momchilgrad, which is now being continued south to Giurgiurdzhina (Komotini). It also serves as part of the Ruse - Stara Zagora - Rakovski - Svilengrad line.

First planned in 1914 as part of an international route connecting the Baltic with the Aegean Sea at Porto Lempa, the line was begun in 1930. The bulk of the work was done during 1935/36 and the line was opened on October 11, 1936. It is 33.517 kilometers long and has the following general characteristics:

The maximum gradient of 15 0/00 is used over 5.133 km. in the sectors between Dimitriev and Merichleri going south, and Mariino and Brest going north.

The terrain is hilly and bare. The majority of cuts, retaining walls and embankments have had to be reinforced with heavy masonry walls because of the clay soil, which shifts and washes out easily. Soil conditions also forced the construction of a counter-arch in the only tunnel, which is 233 m. long.

The minimum station length is 600 m. with provision for expansion. There are four bridges, one of which is 190 m. long with one 50 m. and four 35 m. arches. The line has 67 conduits. Gradients and curves permit cheaper exploitation and higher speeds than most older Bulgarian lines. Double hauling is not necessary.

Significance:

The Mihailovo - Rakovski line taps a large and as yet relatively undeveloped coal basin. It shortens the distance between Stara Zagora and Rakovski by 128 km. and avoids the necessity of passing through Plovdiv.

As a link in the direct line between Ruse on the Danube and the Turkish frontier at Edirne, the line is of immediate importance to railway and barge commercial traffic between Germany and Turkey as well as to the German and Bulgarian military concentrations on the Turkish frontier. Its long range significance will be as a link in the Ruse - Aegean Sea line, whose southern portion is now under construction.

Mihailovo - Rakovski

b. List of Stations

Km.	Name	Name on Old Maps	Classifi- cation	Distance Between Stations	Length of Sta. Area	Active Length of Sta.	Length of Sta. area horizon- tal	Ele- va- tion (m)
0.000	Mihailovo		Station	6.647 km.	800*mm.	600*mm.	-----	161.96
6.647	Dimitrievo		Stop	10.376 km.	600*mm.	471 m.	1346.2 m.	149.90
17.023	Merichleri		Station	6.245 km.	600*mm.	438 m.	800.0*mm.	141.40
23.968	Brest		Stop	5.020 km.	650 m.	463 m.	1351.4 m.	119.50
28.968	Marino		Station	4.529 km.	737 m.	580.5 m.	1460.0 m.	96.50
33.517	Rakovski		Station		900*mm.	600*mm.	-----	100.13

* Approximate Lengths. The end stations are on the Sofia - Burgas and Sofia - Istanbul lines respectively.

** Merichleri station is built on a 1 0/00 gradient.

(20638)

c. Vulnerable Points

Engineering Works. On the Mihailovo - Rakovski line there are two short reinforced concrete and one 190 m. steel girder bridge, and one 233 m. tunnel. The two most important engineering works, the steel bridge and the tunnel, are located at the southern end of the line between Brest and Rakovski.

Steel Bridge Between Mariino and Rakovski with 5 simple truss steel spans and 4 stone masonry pylons. One span is 50 m. and 4 are 35 m. each. The long span is at the S end of the bridge.

Tunnel between Brest and Mariino, 233 meters long, built on a curve with the gradient of 15 0/00. It is approached from the N through a cut 400 m. long, faced with masonry. The tunnel is built through a hill of wet clay and 3 layers of lignite coal. The weak nature of the soil required the building of a counter arch under the track. The tunnel is faced with concrete blocks over poured concrete. A cut at the southern entrance is about 100 m. long, partly faced with masonry. The mean elevation of the tunnel is 105 m.

Concrete Arch Bridge between Dimitriev and Merichleri, with a 15 m. central arch and two 5 m. arches of poured reinforced concrete. Because of the poor soil, the end arches have been strengthened by sub-surface counter arches. The bridge is 10 m. high and built on a curve with a radius of 450 m. and a gradient of 13.5 0/00, sloping down toward Merichleri station.

Embankment 300 m. long and 18 m. high immediately S. of Dimitriev station. The embankment is built on a curve and has a 3 m. culvert.

Embankment 1,600 m. long and up to 12 m. high, between the tunnel and the Maritsa river bridge. Mariino station buildings are built along its southern side. The embankment consists of clay from the tunnel and cuts and slag from the Maritsa coal mines.

Station Facilities. There are water towers at Mihailovo, Merichleri and Rakovski, and a small engine shed and turntable at Rakovski. For details of station areas see chart above.

d. General Details

1. Gauge: 1.435 m.
2. Length: 33.517 km.
3. Track: Single track (except for 2.4 km. at Mihailovo and 2 km. at Rakovski where the new line parallels the main lines which it joins.)
4. Permanent Way: New steel rails, purchased from Poland and weighing 34.800 kg. per lineal meter (type "Southern Lines"). The height of the rails is 131 mm. and their length 15 m. Oak sleepers 0.16 x 0.25 x 2.50 meters are used throughout and rails are fastened with hooked steel plates, 3 spikes per plate. The ties are 77 cm. apart except at joints where they are from 53 to 69 cm. apart. The ballast is 35 cm. thick.
5. Maximum Permissible Axle Load: 17 tons (wartime 18 tons)
6. Gradients: 15 0/00 maximum used over 5.133 km. or 15.30% of the line and encountered in both directions. Other gradients: 10 to 15 0/00 inclusive --- 6.920 km; 5- 10 0/00--- 3.790 km; 1 - 5 0/00 --- 7.625 km; horizontal --- 15.182 km. or 45.3 %.
7. Curvature: 300 m. minimum radius used over 2.719 km. or 8.10% of the line. 19.636 km. or 58.6% of the line are straight.

8. Engineering Works: 4 bridges, 190 m., 25 m., 15 m., and 4 m. respectively; 67 culverts from 0.6 m. to 3.0 m.; 1 tunnel, 235 m., two embankments, 300 m. and 1,600 m. respectively; two cuts, 500 and 100 m. respectively at either end of the tunnel; 38 grade crossings, of which 5 are 3 m. wide, 9 are 4 m., 11 are 5 m., 9 are 6 m., 3 are 10 m. and 1 is 12 m. wide. Station and maintenance construction is as follows:
- km. 0.000 - 2- story station building and freight depot at Mihailovo
 - km. 2.046 - sector maintenance and guard post (one-story)
 - km. 6.300 - sector maintenance and guard post (one-story)
 - km. 6.647 - double maintenance building at Dimitriev Stop (serves as station)
 - km. 12.940 - sector post
 - km. 16.300 - sector post
 - km. 16.800 - maintenance crew resident at Merichleri station
 - km. 16.900 - two family station-master residence.
 - km. 17.023 - 2- story station and freight depot at Merichleri.
 - km. 23.800 - maintenance crew residence at Brest stop.
 - km. 23.968 - double maintenance house at Brest (serves as station)
 - km. 28.800 - 3-family station master residence at Mariino station.
 - km. 28.988 - station at Mariino (probably one-story)
 - km. 29.200 - sector post
 - km. 33.500 - new locomotive turntable at Rakovski station.
9. Traction: Steam, Lignite coal mined in large quantities at and near Mariino station.
10. Maximum Distance Between Stations. 10.376 km. (Dimitriev-Merichleri).
11. Capacity: About 20 trains per day in each direction. Seven operated in 1937
12. Journey time: About 1.2 hours for stopping train.
13. Engine Sheds: Small shed (2 or 3 locomotives) at Rakovski. Possibly a small new one at Mihailovo.
14. Marshalling Yards: Limited facilities at Rakovski and Mihailovo.
15. Watering Facilities: Mihailovo, Merichleri, Rakovski.

e. Description of the Line

Km.	Altitude in meters	Stations	Engineering Works	Remarks
0.000	161.32	Mihailovo		WB (30 T). Station on right (W). J rt.
2.046			Sector post	Line parallels main track to Plovdiv along the right bank of a tributary of Oluk-Dere river.
2.400				Line leaves trunk line and turns SE
2.754			Bridge over Oluk-Dere river (15 m.).	The bridge is of reinforced concrete slabs and has two 7.5 m. openings. Line turns SSE and continues along right bank of Oluk-Dere river.
6.647 (20838)	149.80	Dimitriev (stop)		Line turns SE

Km.	Altitude in meters	Stations	Engineering	Remarks
7.500			<u>Embankment</u> 18 m. high over Dibek gully.	Line makes a big curve, turning from SE to WSW. The em- bankment has a volume of 52,200 cubic meters. Line, going in WSW direction begins to climb with the maximum gradient of 15 0/00.
7.800				
9.300	180.70			Line reaches summit and runs level for 1.330 km.
10.660	180.00			Line begins to descend into the Merichleri River valley along the N side of a depression or gully.
12.940			Sector post	
13.502	150.30		<u>Bridge</u> over Merichleri river (25 m.)	The bridge, made of reinforced concrete, has a 15 m. central arch and 5 m. side arches. It is built on a curve with a radius of 450 m. and with a gradient of 13.5 0/00. The line turns S following the right bank of the Merichleri river at a distance of about 500 m.
16.300			Sector post	
17.023	141.38	Merichleri		W. Station (on left) is east of the town.
19.000				Line turns ESE pass- ing Merichleri mineral baths, and follows right (S) bank of Merichleri river.
23.968	119.50	Brest (stop)		Line continues ESE.
26.300			<u>Cut</u> , 300 m. long.	Line leaves river and curves into hillside through a deep cut faced with stone climbing slightly.

Km.	Altitude in meters	Stations	Engineering Works	Remarks
26.670	108.60		<u>Tunnel</u> , 233 m. long.	Tunnel is on a curve with a radius of 300 m. and a gradient of 15 0/00 sloping down toward Mariino.
26.903	105.00			Line leaves tunnel running in a SW by W direction.
28.400	99.00			Line enters Mariino station area passing onto an embankment with a volume of 36,000 cubic meters.
28.988	98.50	Mariino	<u>Embankment</u> , 1.400 km. long.	
30.288			<u>Bridge</u> over Maritsa river (190 m.)	Bridge runs in NE-SW direction. It has one 50 m. and four 34 m. simple truss steel spans.
30.800			<u>Bridge</u> over stream (4 m.)	Line makes big curve and runs E and approaches the Plovdiv-Svilen- grad trunk line.
32.533	100.15			Line parallels trunk line to Rakovski station running E by S.
33.517	100.18	Rakovski		EB;W; Tbl.;J.

4. Kurdzhali - Momchilgrad - Polyanthos - Giumiurdzhina Line
(Momchilgrad - Polyanthos Sector under Construction)

History and Significance: The Kurdzhali - Momchilgrad line is the last completed portion of the Ruse - Stara - Zagora - Rakovski - Giumiurdzhina railway which connects with the Danube ferry and intersects all east - west trunk lines, is intended to be a commercial through line from the Baltic to the Aegean, as well as tap the rich Rodopi mountain tobacco and mining areas.

The bulk of the work was carried out in 1930/31. The line was opened December 4, 1932 and is 14.418 km. long.

The new sector to Polyanthos on the Salonika - Dedagach line was begun in June, 1941 as soon as Bulgaria was allowed to occupy Greek Thrace. The new sector is 95 km. long. It will have maximum grades of 15 0/00 and curves with a minimum radius of 500 m. For the approximate route of the new line see attached map.

a. Description of Kûrdzhali - Momchilgrad Sector:

1. Leaving Kûrdzhali station (km. 84.850 from Rakovski) which is 2 km. ESE of the town in an easterly direction, the line turns sharply south to the Arda river. At the curve a short industrial line to mining concessions of the town trails right.

2. The Arda is crossed at km. 85.256 on a 140 m. stone arch bridge which carries a two lane highway in addition to the single track railway line. The bridge, which runs approximately north and south, has 7 arches of 20 m. each. Construction materials are stone and concrete.

3. At the south end of the bridge the line turns south by east skirting a bare rocky mountain to the railway stop of Gledka (km. 88,000 approx.) From Gledka the line continues S by E through hilly country entering the Siutliika valley and approaching the river.

4. The Siutliika is crossed on a high stone arch bridge 80 to 100 m. long at km. 90.668. The bridge runs diagonally across the river in a SE direction. It has 6 arches, and is between 15 and 25 meters high. Beyond the bridge the line turns up the Siutliika valley skirting bare rocky hills, through low cuts and on embankments. It keeps on the high bank between 500 and 1000 m. east of the river.

5. At about km. 95 the line reaches Dzhebel stop and continues along the east bank of the river crossing two ravines before it reaches Momchilgrad, located in a small plain. The station (km. 99.300) is at the north side of town. The completed portion of the line ends beyond the station at km. 99.713, where there is a turning loop.

b. Momchilgrad - Polyanthos Guimiurdzhina Sector. (Distances are approximate.)

1. Skirting the east side of the town the railroad crosses the main highways to Edirne and Komotini (Guimiurdzhina), and after crossing two small creeks, approaches the Siutliika river.

2. At km. 103 a high spur of the mountain approaches the river and the railway skirts it on a gallery. There may be a short tunnel. The line climbs gradually.

3. At km. 104.500 the line enters one of the small cultivated plains which characterize the Siutliika valley. At km. 114 the valley again narrows and at Chorbazhiisko village the Komotini highway, the river and the railway come together.

4. South of Chorbazhiisko village the river turns SW then W. The railroad follows it, keeping on the south (right) bank, crossing a tributary on a high bridge at about km. 115,500.

5. The line runs in a westerly direction skirting the mountains and keeping close to the river. It crosses four side ravines before it reaches Zlatograd at km. 143.700. The mountainsides are steep and there are numerous cuts, galleries and embankments.

6. South of the town of Zlatograd the line makes a sweeping curve and turns SW up the floor of a ravine 300 m. wide, keeping on the west side.

7. At about km. 145.500 the line enters the Rhodopi watershed tunnel which will be between 1 and 1.5 km long. The tunnel which runs almost NE and SW slopes down toward the south and emerges north of the village of Medousa (Megova), on the Megova creek. The river bed is dry during most of the year. The pre-war Greek-Bulgarian border is crossed in the tunnel.

8. The line turns SE descending into the Megova valley and staying on the north (left) bank of the river. At about km. 170.000 the line passes Kottani (Kozlanlar) village, on the north side away from the river. There are many embankments and galleries in this sector and there may be several short tunnels.

9. The line turns SSE at Kottani and continues on the left bank of the river passing between Isalapetinos village and the river at km. 174.500. The banks continue to be steep.

10. Opposite km. 176.750 the Xeropotamo (Kuru-Chai) river approaches from the west and joins the Megova river at Imourava village. Though continuing in the same direction as the Megova, the river below this point is named the Xeropotamo (Kuru-Chai). The line continues in a SE by E direction along the left bank to Kalamaki village at km. 180.250, descending gradually.

11. At km. 181.250, one kilometer SE of Kalamaki village the line probably crosses to the right bank of the Xeropotamo to avoid a 2 km. long cliff on the left bank. Near the bridge the line turns SSE.

12. At km. 183.750 the line crosses a deep gully and continues on the west (right) bank to km. 185.000 where it crosses back to the east (left) bank of the Xeropotamo near the village of Skapon.

13. Beyond the bridge the line runs close to the river crossing 4 deep gullies before it reaches Polyanthos station at km. 195.000 from Rakovski. Polyanthos is on the main Saloniki - Dedegach line, about 16 km. from Komotini (Giunardzina). The total length of the Momchilgrad - Polyanthos section is 95 km. The Bulgarians intend to continue the line south from Polyanthos to Porto-Lagos on the Aegean Sea.

5. Krichim - Peshtera Line

The 28.5 km. long Krichim - Peshtera line, which is to be extended to Batak is of great economic importance. The line serves the rich agricultural triangle between the Vucha and Maritsa rivers where intensive vegetable, fruit and industrial crop growing is carried on, and where a canning and fruit preserving industry has developed. It also serves the large hardwood forests between Peshtera and Batak. The line was completed in December, 1937 and is 28.505 km. long.

b. General Details

1. Gauge: 1,435 mm.
2. Length: 28,405 km. (Together with sidings: 31.656 km.)
3. Track: Single track throughout.
4. Permanent Way: Rails are used ones, type R.P.Sh. taken from the Sofia Varna line. They weigh 31 kg per lineal meter and are 126 mm. high and 9.55 m. long. The average weight of a running meter of roadway is 75.9 kg.

(20838)

a. List of Stations

km.	Name	Classification	Distance Between Stations	Length of Station or stop (m)	Active length of Station in meters	Length of Horizontal in meters	Elevation
0.00000	Krichim	Station	(Station on the Sofia - Plovdiv line)				181.51
7.70063	Kurtovo Konare	Stop	5.70063	500	377.80	537	197.36
10.65326	Vilcha	Station	4.96263	500	358.30	520 on a 1 0/00 grade	215.14
14.96343	Kozarsko	Stop	4.31017	450	368.09	506	239.14
18.50134	Bega (Braga)	Stop	3.53791	450	342.30	561.50	286.34
22.98973	Bratsigovo	Station	4.48839	500	364.20	1012.50	367.03
28.19538	Peshtera	Station	5.20565	530	405.11	542.20	422.00

Note: The station areas at the stops of Kurtovo Konare, Kozarsko and Bega were laid out with regard to easy transformation to regular stations should the traffic warrant such a step.

(20835)

There are 12 sleepers per 9.55 m. of track of which 3 are fastened with three spikes each and two with two spikes each. Average distance between sleepers is 850 mm. There are 39,320 sleepers of which 32,590 are impregnated beech and 6,370 untreated oak. Ballast is river gravel, 35 cm. thick.

5. Maximum Permissible Axle Load: 14 tons (wartime 15 tons)
6. Gradients: The 25.62 0/00 maximum gradient is used over 5.656 km. or 19.84% of the line. A total of 9.362 km. or 32.84% of the line has grades over 15 0/00. 6.294 km or 22.08% is horizontal.
7. Curvature: The smallest radius is 250 m. used over 2.342 km in the Bega-Peshtera sector. An additional 5.893 km. have radii of from 275-400 m.
8. Engineering Works:
 - a. Bridges: The most difficult and vulnerable part of the line is the sector from km. 20 (between Bega and Bratsigovo) to km. 28.505 the end of the line, where there are numerous high embankments, cuts and a 19 m high bridge over the Stara river. The bridge, located at km. 27.727, consists of four reinforced concrete arches 2 of 14.10 m. and 2 of 12.50 m. Other bridges are a 12 m. steel girder span at km. 9.751, two reinforced concrete spans of 8 m. each at km. 14.600 and km. 24.201, and an 8 m. steel girder bridge at km. 10.196. In addition there are 53 bridges and culverts with openings up to 4 m.
 - b. Embankments: There is an embankment 120 m. long and 12 m. high at m. 22.266, and a 30 m. deep cut at km. 25.500.
9. Traction: Steam.
10. Maximum Distance Between Stations: 12.237 km. between Vucha and Bratsigovo. Maximum distance between station and stop is 5.791 km. (Krichim - Kurtovo Konare.)
11. Capacity: 8 to 10 trains a day in each direction. In peace time not more than 4 pairs of trains were used.
12. Journey Time: 1 hr. 20 min. for stopping train.
13. Engine Sheds: None so far as known. Since all trains on this line operate out of Plovdiv, the facilities of Plovdiv main station are used.
14. Marshalling Yards: Plovdiv station used. Only 3 sidings are available at Peshtera station.
15. Watering Facilities: Krichim and Peshtera.

c. Description of the Line

Km.	Altitude (m)	Stations	Engineering Works	Remarks
0.000	184.51	Krichim (on Sofia Plovdiv line)		Station building on left. (2 story stone) Water tower. Line leaves W end of station and takes on a WSW direction.
1.000	c.187		Small culvert or bridge	Line crosses a creek and turns to SW by S direction remaining W of the Krichim station-Krichim village highway.
3.875	192.00		Maintenance Post	Line climbs very gradually in a straight line.
5.791	197.36	Kurtovo Konare (stop)	Small station building and maintenance post.	Station on left. Line passes W of the village and continues SW by S.

Km.	Altitude (m)	Stations	Engineering Works	Remarks
6.800	199.80			Line crosses highway to Krichim village.
7.238	c.202		2 m. iron girder bridge	
7.700	206.90			Line crosses several creeks and passes E of a furniture factory and a rope factory located on the highway.
9.751	c.213		Steel girder bridge, 12 m. long	Bridge is over a canal connecting the Krichim and Stara rivers.
9.900	c.214			Line recrosses to W side of highway turning from SW by S to W
10.196	c.214		Steel girder bridge, 8 m. long	A second similar bridge lies 150 m. W
10.653	215.14	Vúcha	Station on left	Two story station building with freight storage and loading ramp in E wing. From Vúcha the line takes a WNW direction climbing with grades up to 10 0/00 through tobacco fields and vineyards.
14.600	c.238		Bridge of reinforced concrete, 8 m. long.	Line runs in a westerly direction to Kozarsko.
14.963	239.14	Kozarsko (stop)	2 station buildings on left.	Station is 115 km. N of the Village. Line turns W by S climbing slowly and approaching the mountains.
16.223	c.255		Bridge of concrete 2 m. long.	
18.501	286.34	Bega (Stop)	Station on right	Station is S of the village. Line turns WSW beginning to climb steeply with gradients of over 15 0/00.
20.530	326.50		Sector post	Located left of track. Line crosses main Bratsigovo - Pazardhik highway and turns SSE along the right bank of the Bratsigovo creek, paralleling the highway.
22.266	c.259		Embankment 12 m. high	Line crosses a gully on a 12 m. high embankment.

Km.	Altitude (m)	Stations	Engineering Works	Remarks
22.989	367.83	Bratsigovo	Two story station building on left	Station is 1.750 km. NNW of the village. South of the station the line makes a sweeping curve, crossing the Bratsigovo creek and turning NNW toward the Stara river.
23.500 to 25.000			6 to 12 m. embankment with 3 wide culverts.	
24.201 c.389			Bridge of concrete 8 m. long.	Over tributary of Bratsigovo creek.
25.000 to 26.000			Cuts through rock up to 25 m. in depth.	The maximum grade of 25.62 0/00 and the 250 m. curves are used in the Bratsigovo - Peshtera sector.
26.200 c.400				Line turns W by S along slope of hill.
27.727	419.44		Bridge of reinforced concrete 75 m. long. 4 arches (2 of 14.10 m; 2 of 12.50 m.) Height 19 m.	Line crosses the Stara river diagonally. The bridge slopes up toward Peshtera.
28.195	422.00	Peshtera	Station building 2 stories	Station on left. NE of town.
28.505	423.00			End of line.

6. Notes on the Krumovo - Asenovgrad Line 1/

The Krumovo - Asenovgrad line is 10.200 km. long. - It branches from the Plovdiv - Svilengrad line 8 km. E of Plovdiv and runs to the entrance of the Stanimaka or Chaia river gorge on the north side of the Rhodopi mountains. Asenovgrad is primarily a resort city, but the line also serves a large lumber and tobacco industry. It is planned eventually to continue this line south up the Chaia river to Chepelare and Ustovo in the heart of a rich but hitherto inaccessible tobacco and mining area.

Engineering Features.

The line has two short curved stretches with radii of 350 m. One is at Krumovo station and the other at Asenovgrad. The rest of the line is perfectly straight. The maximum gradient of 12.6 0/00 is used only over 400 m. There are only 2 bridges and culverts with openings up to 3 meters.

Description of the Line.

The line leaves Krumovo station in an easterly direction but immediately curves SSE. It runs in a straight line, climbing slightly, along the west (left) bank of the Chaia river to the west side of Asenovgrad where it curves E into the station. Krumovo and Asenovgrad are the only stations. Repair and other facilities are available only at Plovdiv.

1/ Spisanie, op. cit., Nov. 1928, pp. 148/49

7. Notes on the Levski - Lovech Line

This line, 46.700 km. long, opened in November, 1927, is a link in a projected trans-Balkan line which is to connect the Danube at Svishtov with the Maritsa valley at Plovdiv. Completed are the sectors Svishtov - Levski, Levski - Lovech and Karlovo - Plovdiv. Under construction for some years has been the Lovech - Troyan sector; the link across the Balkan mountains with a 5 km. watershed tunnel is still only in the projected stage. South of Plovdiv a small sector to Asenovgrad is completed and a projected continuation S via Chepelare and Ustovo to Kŭrdzhali will connect Plovdiv with the Aegean coast when the Momchilgrad-Polyanthos line, now under construction, is completed.

The Levski - Lovech line serves a fairly rich agricultural region along the Osam river and is the outlet for the leather and livestock industry of the Lovech and Sevlievo areas.

The line leaves Levski station in a westerly direction and with a sweeping curve turns SW following the left (W) bank of the Osam river to Lovech. Lovech station is at the southern end of the city near the State Hospital and is arranged with a view toward continuing the line up the Osam river to Troyan. A military airdrome is located W of Levski stop.

Engineering Features:

The length of the line is 46.700 km. The maximum gradient is 15 0/00 used in 12 places over a total length of 10.500 km. The horizontal portion of the line is 14.500 km. long and the rest of the line has gradients of from 2 to 12 0/00.

The minimum radius of the curves is 250 m. used in 8 places. 32.803 km. are straight. There are 68 bridges and culverts, none of which are significant.

Location of Stations:

km.0.000 Levski
 km.5.300 Osno Kalugerovo
 km.8.120 Letnitsa
 km.14.600 Lŭzhene (stop)
 km.19.260 Aleksandrovo
 km.23.150 Drenov
 km.30.130 Doirentsi
 km.32.520 Ioglav
 km.36.800 Omarevtsi
 km.42.540 Lovech (stop)
 km.46.360 Lovech (Main station)

See attached diagram of this line.

8. Notes on the Kostinbrod - Batanovtsi Line
(Under construction)

This line was evidently planned to help provide a safer railway route for German men and material to Salonika, (by way of Nish, Kostinbrod, Batanovtsi, Gorna Dzhumaja and Siderokastro) than the Nish - Skopie - Salonika line, which is exposed to guerrilla activity. It by passes Sofia, a serious bottleneck and avoids the Sofia and Pernik stretch which carries the nations' coal supplies. The line directly connects the country's largest chemical plants at Kostinbrod with the largest cement plant at Batanovtsi.

There is some doubt as to the exact route of the Kostinbrod - Batanovtsi route, since the projected length in some sources is indicated as 59 km. From a topographical point of view there are two routes which, the line could follow. Both are about 47 km. long. One route is via the city of Breznik and is the more probable since a Batanovtsi - Breznik line has been planned for some time. The other route winds through the hills in a more direct line. Both are identical except for 22 km. in the middle.

A Kostinbrod - Breznik - Batanovtsi line would probably follow the left (north) bank of the Belitsa river crossing the Sofia - Nish highway 5.5 km. west of Kostinbrod station.

At about km 11 the line would turn to the south west, entering the Viskyar mountains, keeping on the left bank of the Belitsa river. It would pass near the villages of Zlatusha and Delyan (Kurnul) to about km. 21 where the two possible routes divide.

The Breznik route would leave the Belitsa at km. 21 and turn west, crossing the watershed near Tsurvenyak hill and descending relatively steeply to Breznik at about km. 29.

Passing around the flat, north side of Breznik, the line would turn south along the Breznik - Radomir highway, reaching the Konska river at about km 35. The line would follow highway and river in a SE by S direction to Yardzhilovtsi village (km. 42) then S till it reaches the Sofia - Gorna Dzhumajia line at Batanovtsi (km. 47).

The alternative route would continue SW from km. 21, cross the watershed in sweeping curves at Radnovo Sedlo and join the first route at Yardzhilovtsi, about 4 km. north of Batanovtsi.

There is no data on the progress of this line and material is lacking for a definitive description.

9. Notes on the Pernik-Bankya Line (Projected)

A document from the U. S. Consul, Istanbul, received by the OSS in April 1943 indicates that the Bulgarian government has decided to build a short single track line from Pernik, through the Lyulin mountains to the summer resort of Bankya. It will be about 20 km. long. The plan is evidently to build the line as rapidly and cheaply as possible, and will consequently have very sharp curves and steep grades in both directions. Its primary use will be for the return of empty coal cars from Sofia. This will make it possible for the Pernik mines to increase the coal traffic on the Pernik-Sofia line from 20 to about 30 trains a day and relieve existing congestion.

There is no information available as to whether or not this line is under construction at the present moment.

B. Narrow Gauge Lines1. Notes on the Pazardzhik - Varvara Line^{1/} (76 cm.)

This narrow gauge (76 cm.) line, which runs 16.700 km. from Pazardzhik to Varvara on the Saraniovo - Iztok line, was built in 1927/28 to serve the needs of the rich rice and vineyard region south of Saraniovo. It also carries part of the heavy lumber and tobacco traffic from the Chopino and Nevrokop areas, relieving congestion at Saraniovo.

In the event of damage to the Eli Dere river bridge on the main Sofia - Plovdiv line, the Pazardzhik - Varvara - Saraniovo triangle could serve as a bypass. Due to the difference in gauge, however, this would be a difficult procedure.

The line commences S of the main line yards in Pazardzhik station where there is a narrow gauge turntable and small engine shed. It leaves the station in a WSW direction, through level country, near the villages of Glavnitsa (Bashikirovo), Svetogortsi (Adzhilare), Lyahovo (Yasudzha), Patalenitsa, Batkun and Vetren-dol (Eli Deri) and after crossing the Eli Dere river joins the Saraniovo - Iztok line immediately S of Varvara.

The only station on the line, outside the end stations is at Lyahovo. However, level station areas had been cleared at Svetogortsi and Vetren-dol. Sidings may have been laid there.

Engineering Works:

With the exception of the crossing of Eli Dere river, the terrain is relatively level agricultural land. The wide river basin is crossed on a long and high earthen embankment and two bridges. The first (in the direction of Varvara) is a 30 m. single span iron bridge of simple truss construction. The second, about 300 m. beyond it is a 15 m. stone and concrete arch bridge. About one km. before Varvara station is reached, the Saraniovo - Chopino highway crosses the line by underpass with a 6 m. concrete and stone arch.

There are an additional 3 bridges with 4 m. openings and 33 bridges and culverts with 0.60 m. to 1.50 m. openings.

Gradients:

The largest gradient is 15 0/00 used only over a 1.500 km. stretch. The rest of the line has gradients up to 5 0/00.

Curvatures:

The smallest radius of curves is 75 m., used in two places. All other radii are over 150 m.

Watering Facilities and Marshalling Yards:

Only at Pazardzhik, Saraniovo and Varvara.

Locomotives:

The T76 5/5 narrow gauge tender-type locomotives are used. They were made by "Czechomoravska" locomotive company (Prague 1927) and by M.A.G. (Berlin 1931). Maximum axle load is 9.5 tons.

Rails:

20 kg./m.

^{1/} Spisanie ..., op. cit., November 1928, pp. 145/147.

Notes on the Saranovo - Iztok 76 cm. Gauge Line^{1/}

This line, 104 km. long, is perhaps one of the most complicated lines in Europe from an engineering point of view. The attached diagrams give details of some of the more salient features.

A complete mile by mile description of the line including pictures and diagrams of bridge and tunnel construction is available in the Balkan Section, Europe-Africa Division, OSS. Because of the great vulnerability of this line, which would limit its importance in the event of a United Nations' invasion of the Balkans, these details are not given in this report. The description of the line in the British "Handbook" gives an adequate general picture.

The line to Iztok, is now being rapidly continued to Razlog, Bansko and across the Pirin mountains to Izvorite (Simitli) on the Sofia - Gorna Dzhumala - Demir Hissar line. A spur from Bansko down the Mesta river to Nevrokop is projected. The sector from Iztok to Bansko was opened in April, 1943.

The Saranovo - Iztok railway with the Pazardzhik - Varvara spur are of utmost importance to Bulgarian economy both in war and peace. The Rhodopi mountain area which it serves abounds in good hardwood and pine forests which were difficult to exploit before the line was opened in 1938 (as far as Yakoruda). There are also copper, zinc and lead deposits in the Rhodopi mountains which can now be developed. Lumber hauling, however will always be the primary task of this line.

The vulnerability of this railway, particularly beyond Chopino, is determined by the absence of roads and lack of labor forces in the area as much as by the engineering works. It could be neutralized for long periods by air bombs causing landslides or destroying bridges.

^{1/} Spisanie, Op. Cit. March, April 1938, pp. 81- 132

APPENDIX I. LIST OF IRON AND STEEL BRIDGES ON THE MAIN
BULGARIAN RAILWAY LINES REPLACED SINCE 1922 1/

I. Tzaribrod-Sofia-Svilengrad Line

k.m.	From	Distance from nearest station	Length spans	No. of span	Remarks	Maximum axle load permissible
13.455	Tzaribrod	4 km. from Letnitsa stop	30 m.	1	Road and river underpass, over the Yesovitsa river	18 tons
14.976	"	2.5 km. from Letnitsa stop	10 m.	1	Over a gully	18 tons
40.995	"	1 km. E of Slivnitsa station	20 m.	1	Over the Slivnitsa River	18 tons
52.912	"	0.3 km. SE of Kostinbrod Station	30 m.	1	Over the Belitsa river	18 tons
56.263	"	3 km. west of Voluyak Station	12 m.	1	Over the Cherna Bora river	18 tons
61.646	"	2 km. E of Voluyak Station	20 m.	1	Over the Banska river	18 tons
64.936	"	Sofia: 1 km. W of the Nadezhda repair works	20 m.	1	Over the Suhodol river	18 tons
68.610	"	Sofia: old slaughterhouse	20 m.	5 (parallel 1el)	5 track streetcar and road underpass; weight approx. 35 tons each.	18 tons
68.746	"	Sofia: Vladoysa River canal	20 m.	4 (parallel 1el)	4 track.	18 tons

1. Spisanie na durnavito zheleznitse i pristunishita v bulgariya, Sofia, April 1931, pp. 19-25

(20838)

K.m.	From	Distance from nearest station	Length	No. of spans	Remarks	Maximum axle load permissible
70.234	Terminated	Sofia: 1/4 end of Poduene station	10 m.	5 (paral- lel)	5 track over the Per- lovets canal	18 tons
72.933	"	Sofia: E end of Poduene station	20 m.	4 (paral- lel)	4 track streetcar and road underpass	22 tons
77.438	"	Near Slatina village, 2 km. W of Poduene station	20 m.	1	Over the Slatina river	18 tons
80.239	"	0.2 km. E of Iskar	120 m.	3	3 spans @ 40 m. over the Iskar river.	18 tons
112.564	"	1 km. W of Kozichane station	20 m.	1	Over a branch of the Iskar	18 tons
231.540	Svilengrad Frontier	3 km. E of Nemirovo (Chausshimirovo) station.	20 m.	1	Road underpass	18 tons
220.980	"	1 km. E of Saraniovo station	18 m.	1	Over a branch of the Ristritsa river	22 tons
227.815	"	3.5 km. E of Saraniovo station	48 m.	2	2 spans @ 24 m. over the Eli Dere river	18 tons
212.120	"	4 km. W of Kovachevo stop	11 m.	1	Over a creek	22 tons
200.283	"	4 km. from Pazardzhik station	20 m.	1	Over Vadata river	22 tons
167.765	"	3 km. W of Krichim station	25 m.	1	Over the Vuchka river	22 tons
	"	0.6 km. W of Katunitsa station	90 m.	3	3 spans @ 30 m. over the Chaya river	22 tons

(20838)

SECRET

- 38 -

E.M.	From	Distance from nearest station	Length	No. of spans	Remarks	Maximum axle load permissible
130,560	Svilengrad Frontier	4 km. from Borisovgrad station	20 m.	1	Over an overflow basin	22 tons
121,505	"	1 km. E of Skobelevo station	25 m.	1	Over the Kayliiska river	22 tons
121,090	"	1.5 km. from Skobelevo station	50 m.	2	2 spans @ 25 m. viaduct	18 tons
105,779	"	3 km. from Rakovski station	50 m.	2	2 spans @ 25 m.	18 tons
91,270	"	0.2 km. W of Nadozha stop	10 m.	1	Over a gully	18 tons
89,205	"	1 km. W of Nadozha stop	8 m.	1	Over a gully	18 tons
69,543	"	5 km. N of Harmanli station	10 m.	1	Over the Asmak river	18 tons
66,675	"	2.5 km. N of Harmanli station	40 m.	2	2 spans @ 20 m. Road and creek overpass	22 tons
66,250	"	2 km. N of Harmanli station	66 m.	3	2 spans @ 18 m. one @ 30 m. Over the Olu Dere River.	22 tons
49,517	"	1.5 km. from Lyubimets station	25 m.	1	Over the Indzheli river	22 tons
38,070	"	1.4 km. NW of Svilengrad station	12 m.	1	Over a creek	18 tons
1,378	Sofia	1.3 km. NW of Sofia station	24 m.	2	2 spans @ 12 m.	18 tons
95,262	"	At Oslep stop	15 m.	1		22 tons
130,370	"	5.5 km. from Karlukovo station	45 m.	1	Weight 112.7 tons; over a gully	18 tons

(20338)

II. Sofia-Varna Line

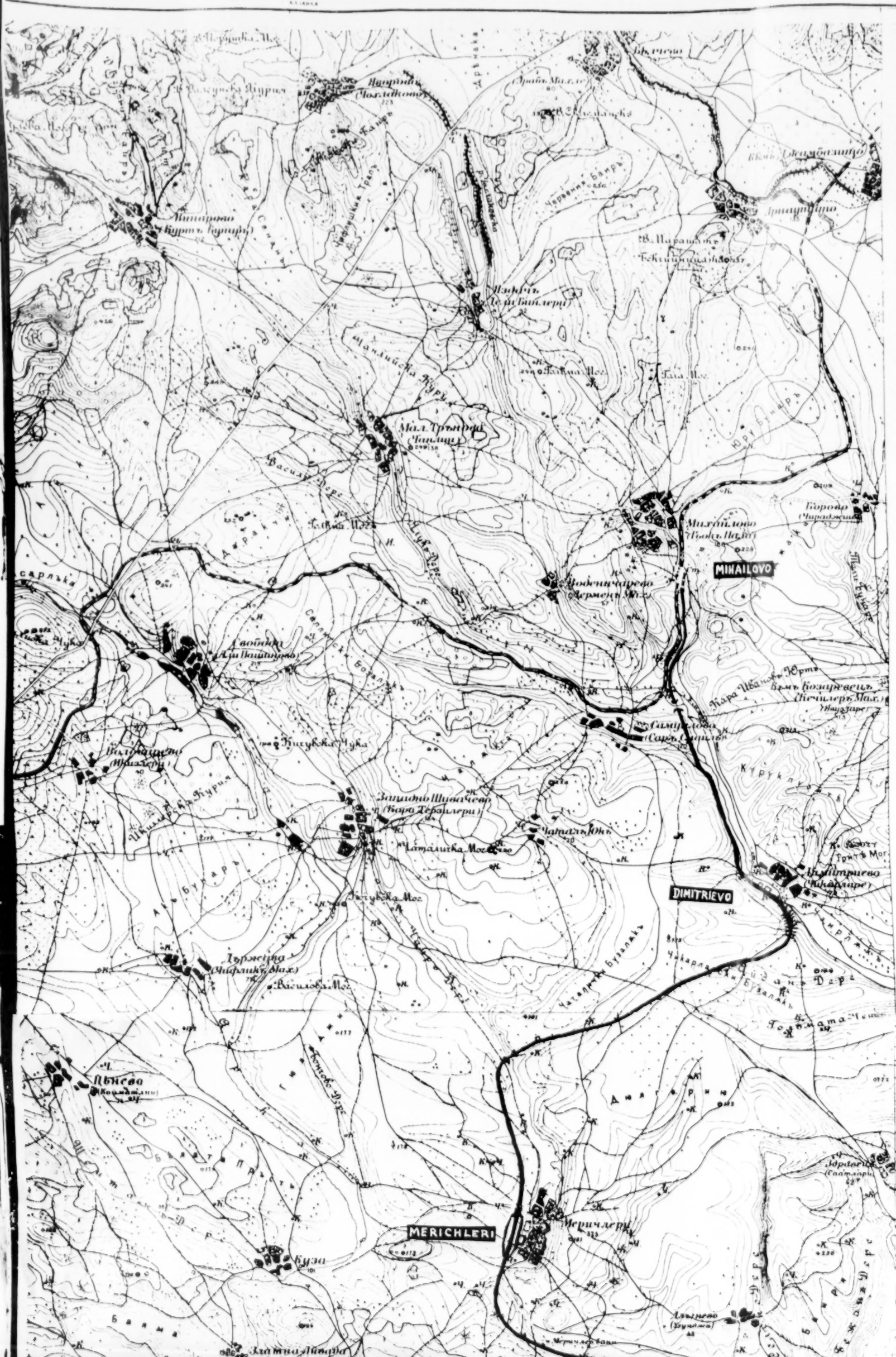
k.m.	From	Distance from nearest station	Length	No. of spans	Remarks	Maximum axle load permissible
130.710	Sofia	5 km. from Karlukovo station	90 m.	2	2 spans @ 45 m. Over the Iskar river	18 tons
140.975	"	0.6 km. from Chervan Breg station	35 m.	1	Over the Iskar river	
188.784	"	1 km. E of Yasen station	90 m.	3	3 spans @ 30 m. over the Vit river	18 tons
242.307	"	1.300 km. on the Variant at Pleven	26 m.	1	2 spans 6 m., one @ 10 m.	18 tons
263.845	"	3.5 km. E of Levski station	35 m.	1	Over the Osam river	18 tons
332.541	"	4 km. from M Stanbulovo stop	50 m.	2	2 spans @ 25 m.	18 tons
335.373	"	0.9 km. from Asenovo station	15 m.	1		22 tons
508.643	"	3.7 km. from Asenovo station	8 m.	1		22 tons
522.447	"	At Sindel station	33 m.	3	2 spans @ 10 m., one @ 13 m over the canal	22 tons
		At Gbedzhe station	8 m.	1		18 tons
III. Plovdiv-Burgas Line						
152.161	Plovdiv	0.7 km. W of Koniovo station	10 m.	1	Over the Sazlika r.	22 tons
IV. Sofia-Kiustendil Line						
26.162 (20838)	Sofia	At Tsunkva stop	25	1	Over the Struma river	18 tons

Due to its large size, the following document has been filmed in segments. The order of the segments is as follows: left to right, top to bottom.

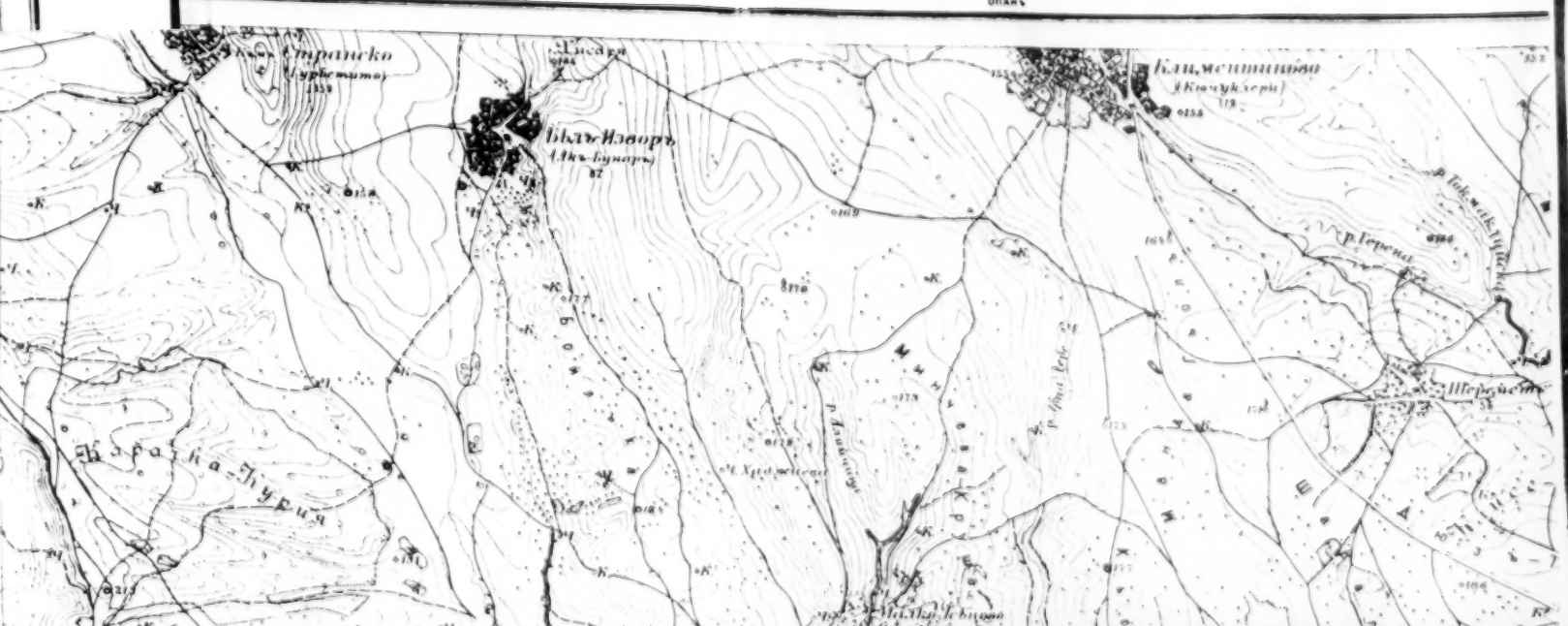
MIHAILOVO - RAKOVSKI LINE

ЧИРПАНЪ-АРНАУТИТО

XIII.14.



КАМЕНЕЦЪ [КАЯДЖИКЪ]

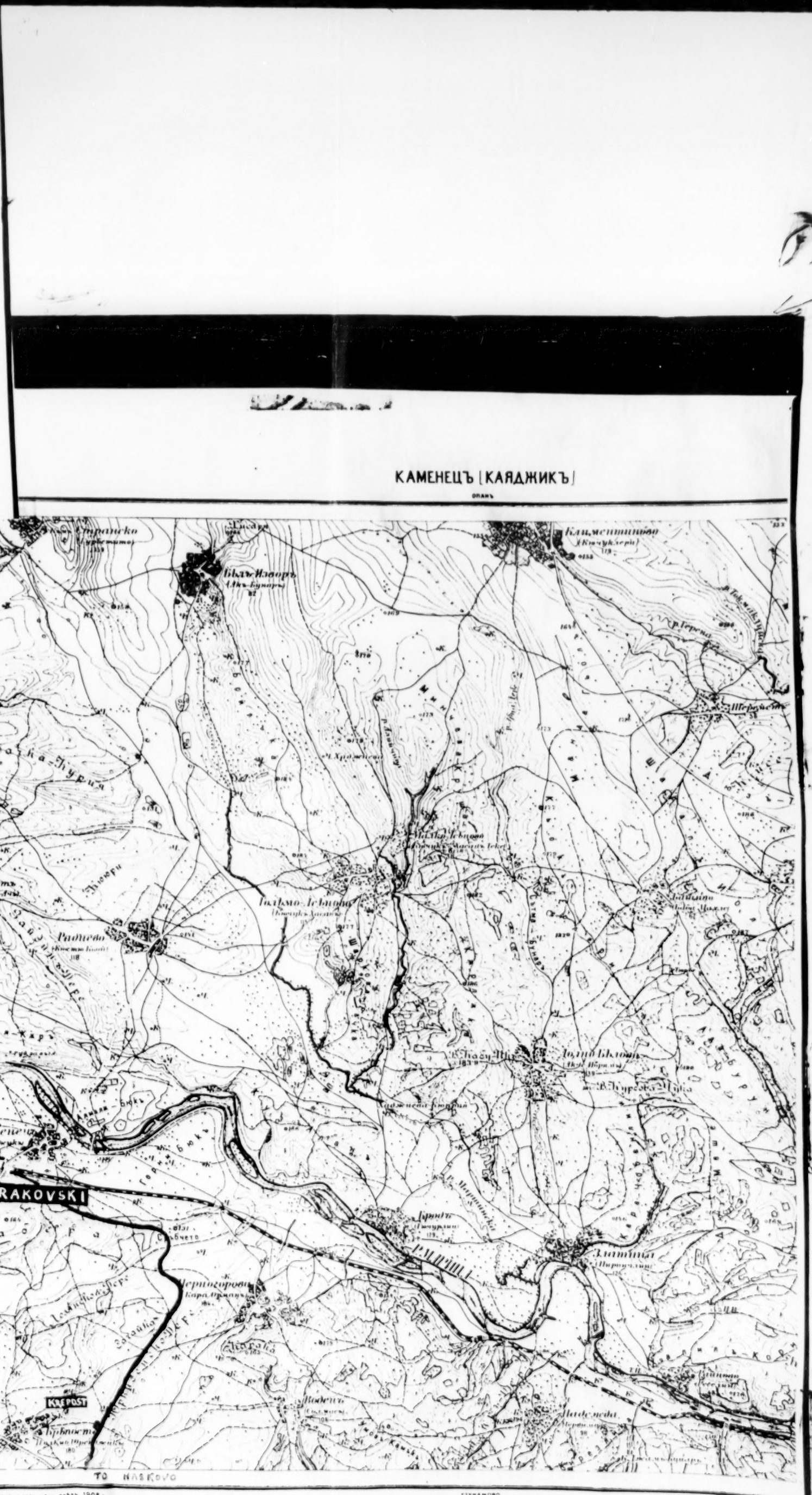




Мѣрка 1:40000.
1:40000
1:40000

XIV-14

474 17



Мѣрка 1:40000.
1:40000
1:40000

КАМЕНЕЦЪ [КАДЖИКЪ]

ПЛЕНА МАКОТСЕВО - СОПОТ LINE

ПЛЕНА



Map Division
AN 10 1978
Library of Congress

КОРДИНАТЫ НА 100 м

Масштаб 1:100 000

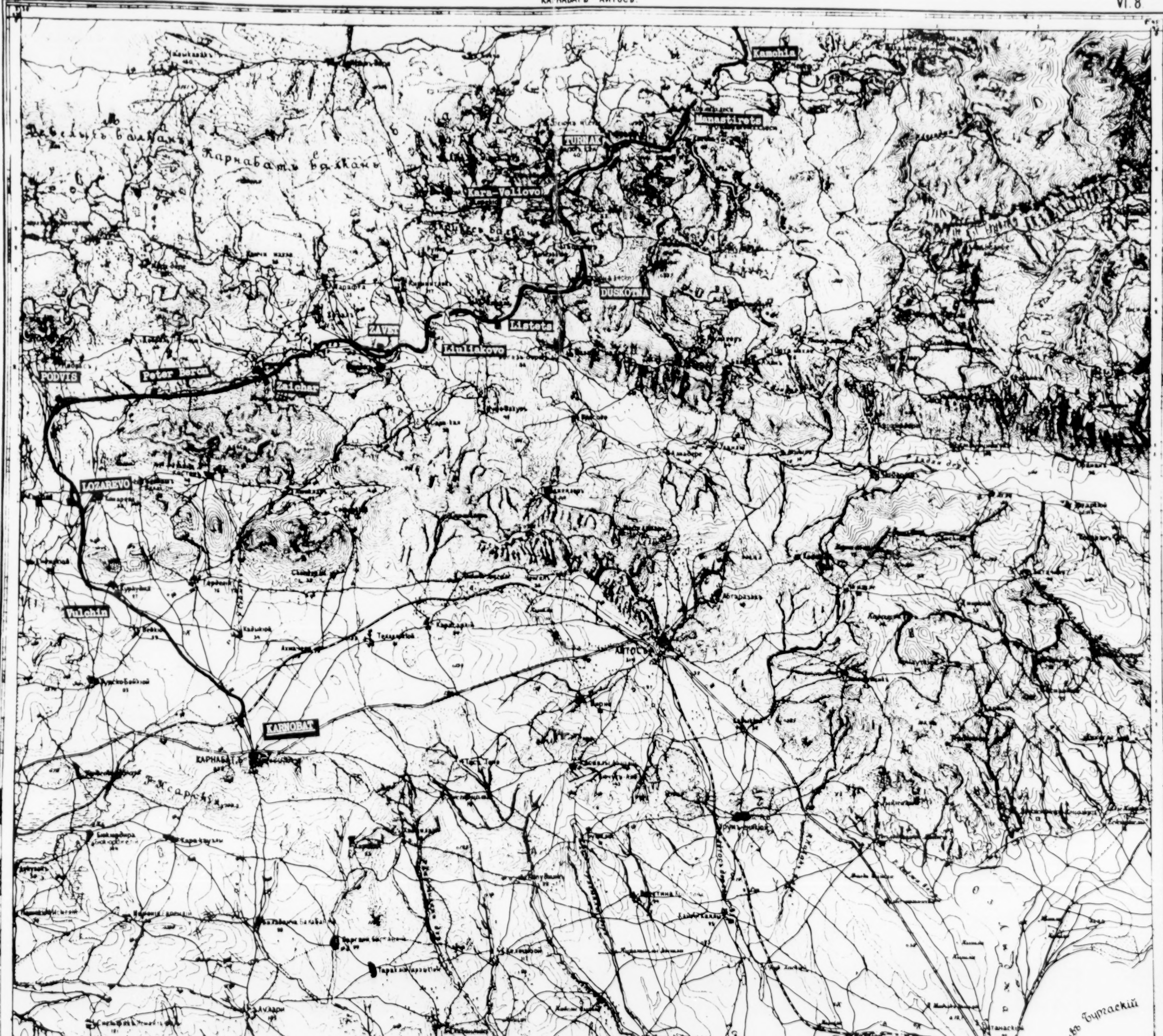
SHUMEN - KARNOBAT

SHEET 2

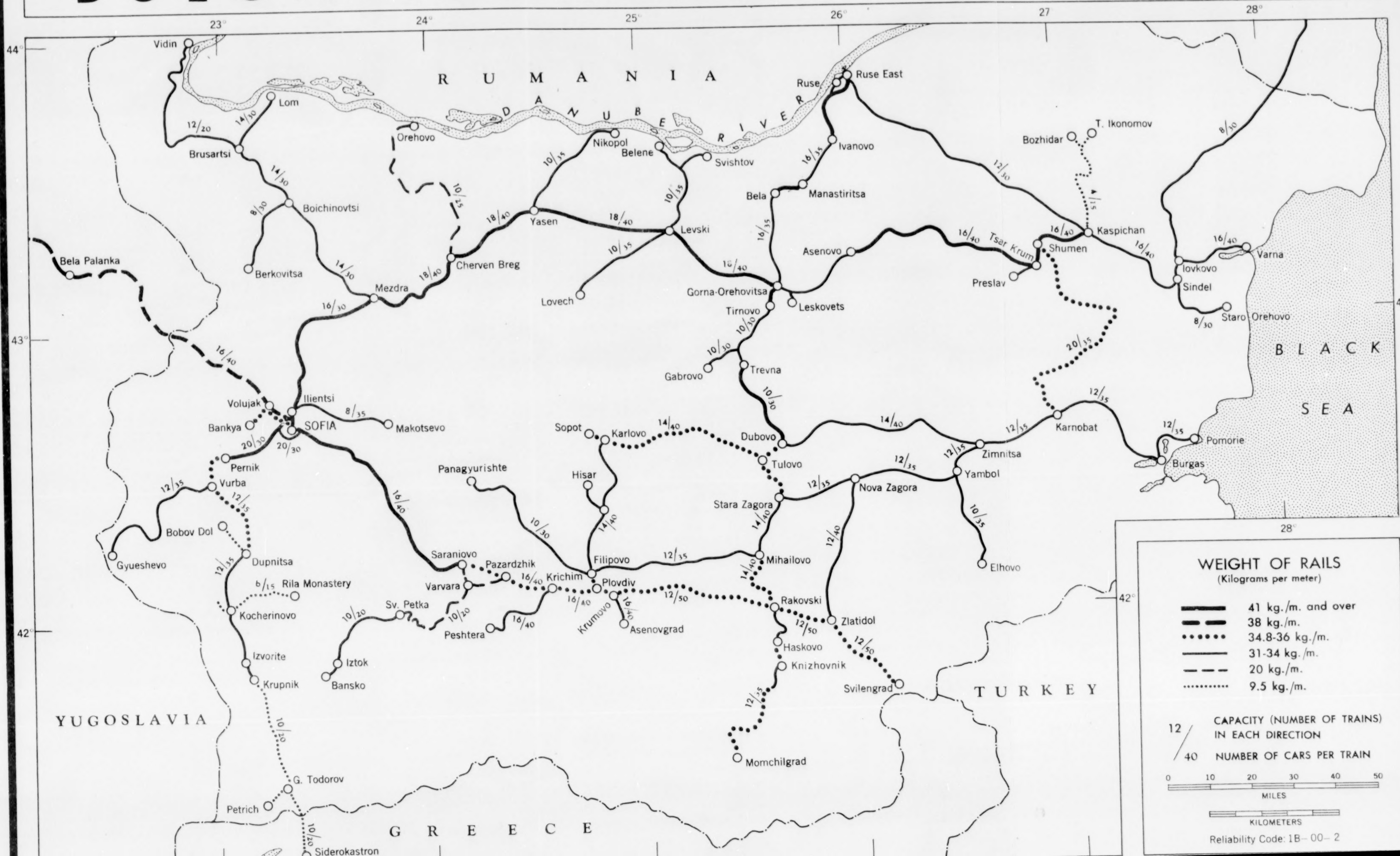
VI. 8

КАРНАБАТЪ АИТОС
KARNABAT AYTOS

VI. 8



BULGARIA: WEIGHT OF RAILS



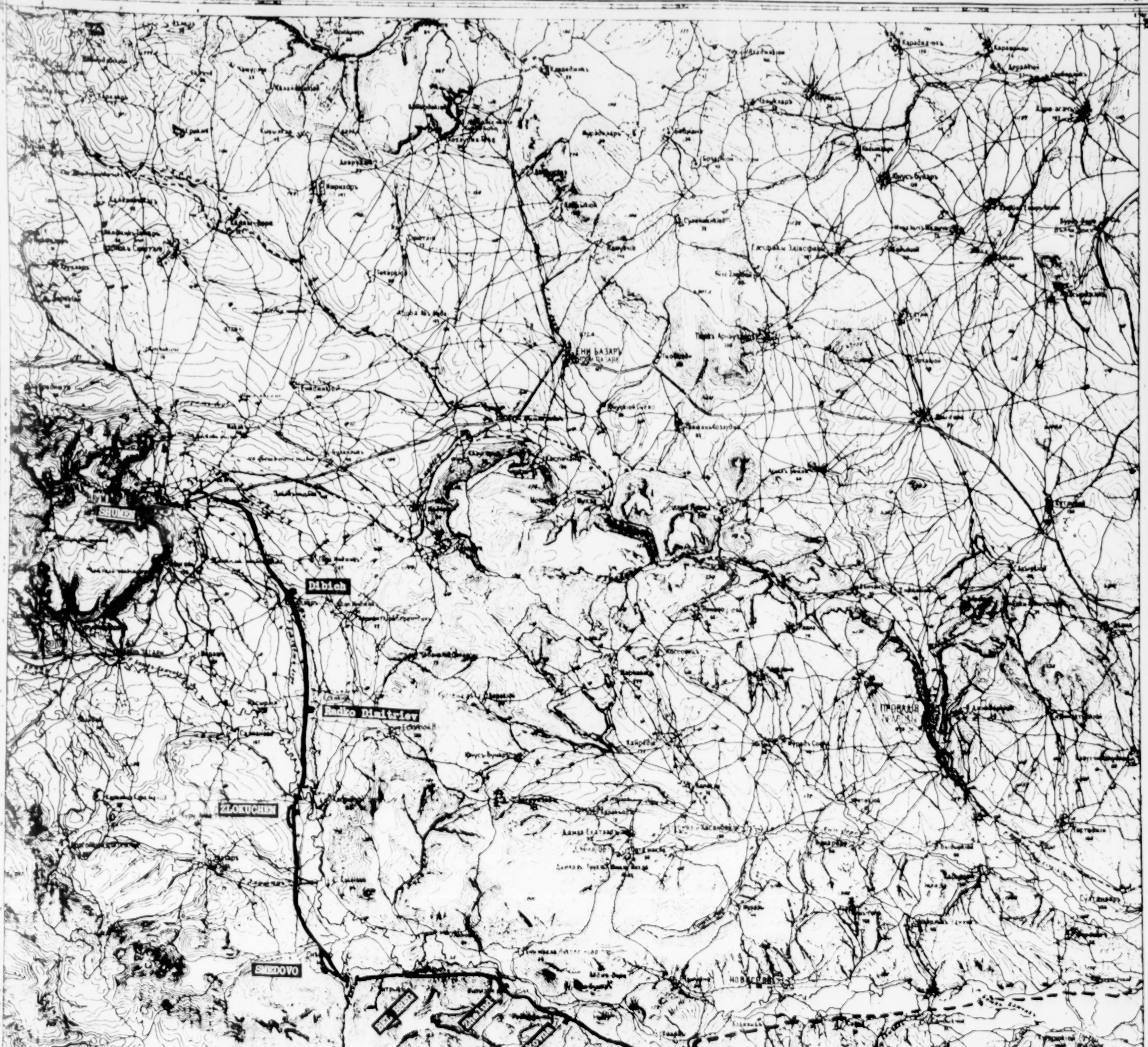
SHUMEN - KARNOBAT

SHEET 1

V8

ШУМЛА ПРОВАДІЯ

V.8.



LEGEND

RAILROADS

- ++++ STANDARD GAUGE
- +++ STANDARD GAUGE UNDER CONSTRUCTION
- + + STANDARD GAUGE PROJECTED
- 760 mm GAUGE
- 760 mm GAUGE UNDER CONSTRUCTION
- 600 mm GAUGE
- 600 mm GAUGE PROJECTED

THE SMALL BLACK SQUARES INDICATE ON WHICH SIDE OF THE TRACKS THE STATION BUILDINGS ARE LOCATED (WITH THE POSSIBLE EXCEPTION OF SOME STATIONS IN THE OCCUPIED TERRITORIES)

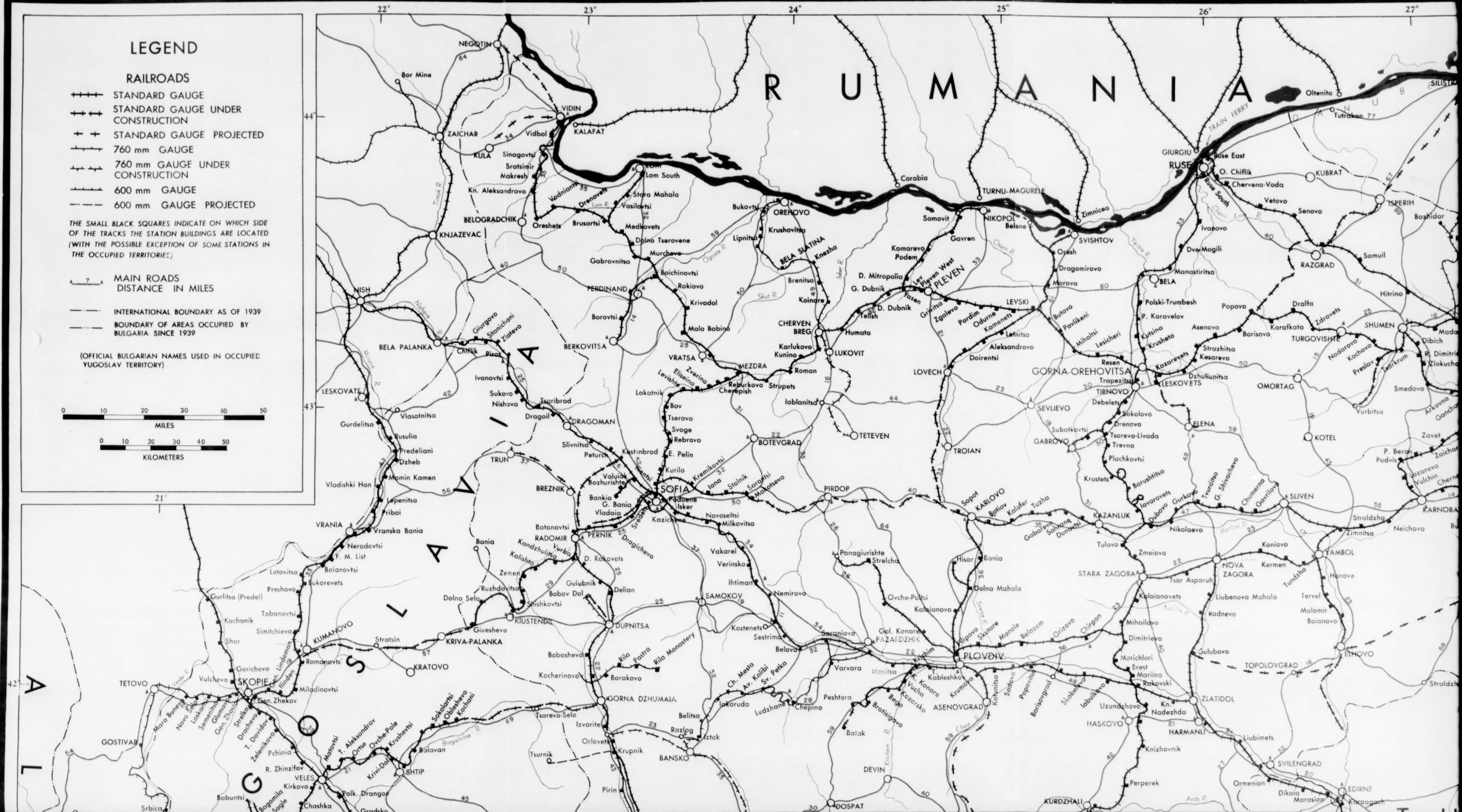
7 MAIN ROADS
DISTANCE IN MILES

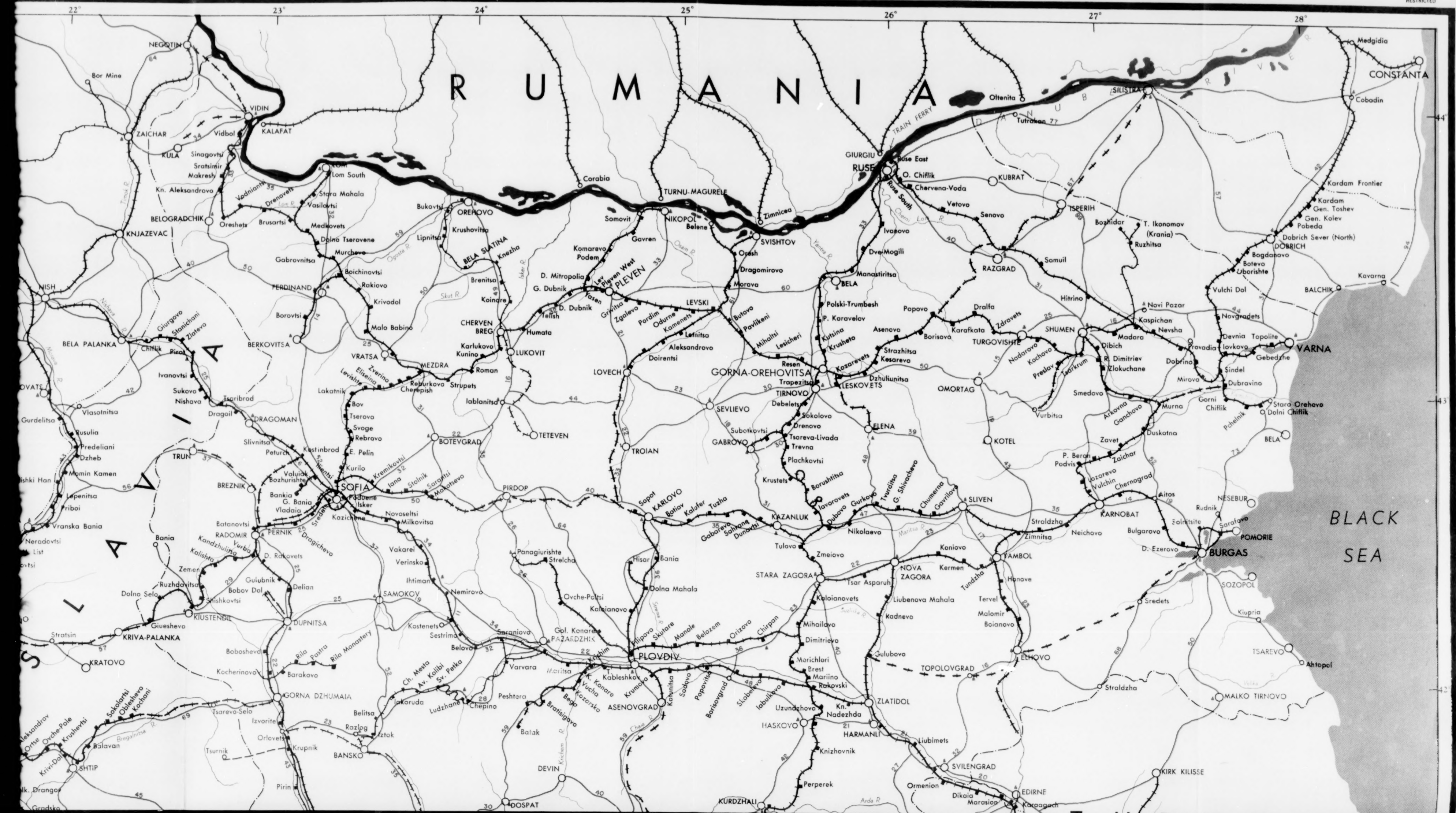
- INTERNATIONAL BOUNDARY AS OF 1939
- BOUNDARY OF AREAS OCCUPIED BY BULGARIA SINCE 1939

(OFFICIAL BULGARIAN NAMES USED IN OCCUPIED YUGOSLAV TERRITORY)

0 10 20 30 40 50
MILES

0 10 20 30 40 50
KILOMETERS





CONSTRUCTION
600 mm GAUGE
600 mm GAUGE PROJECTED

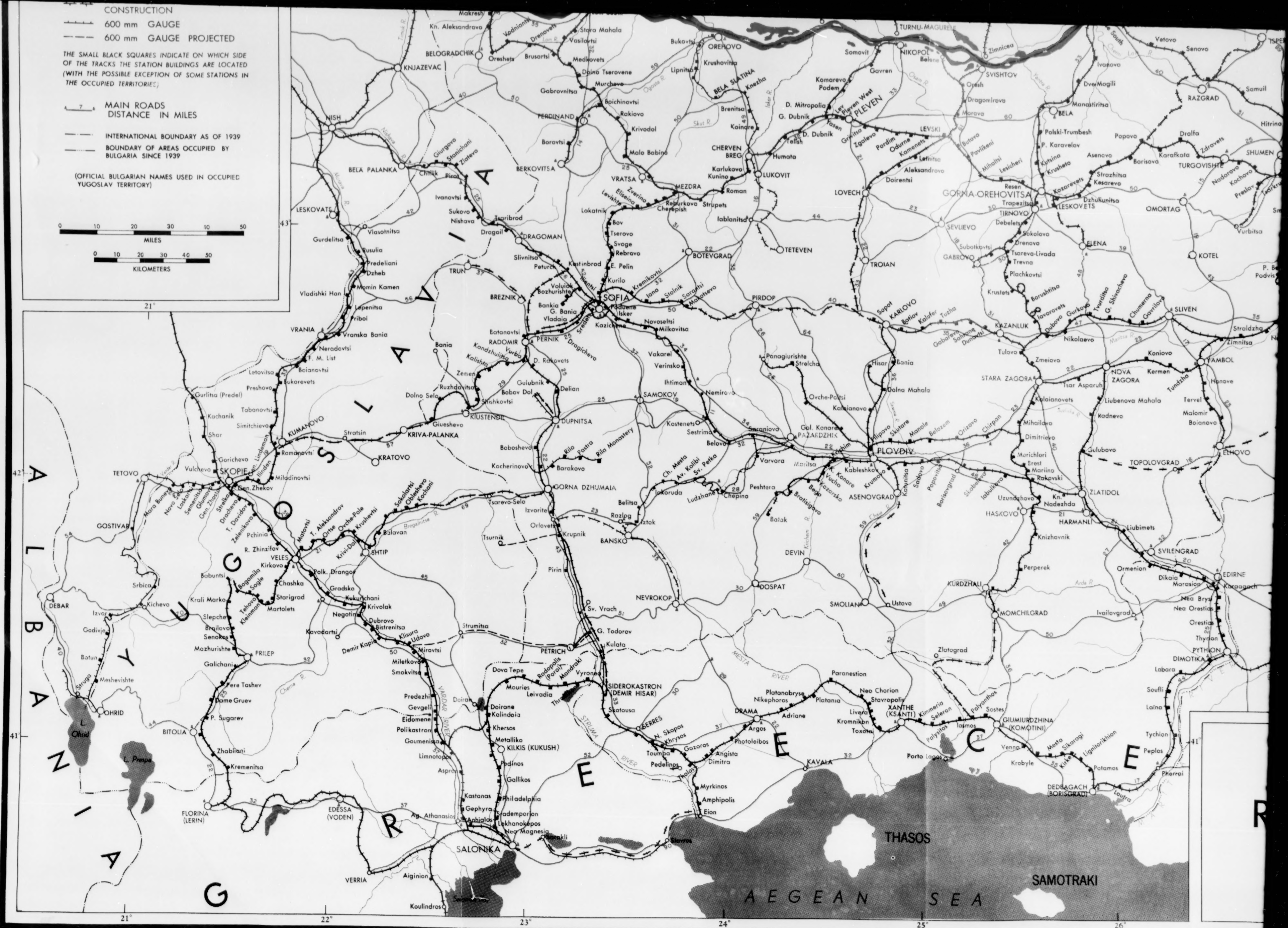
THE SMALL BLACK SQUARES INDICATE ON WHICH SIDE OF THE TRACKS THE STATION BUILDINGS ARE LOCATED (WITH THE POSSIBLE EXCEPTION OF SOME STATIONS IN THE OCCUPIED TERRITORY)

7
MAIN ROADS
DISTANCE IN MILES

INTERNATIONAL BOUNDARY AS OF 1939
BOUNDARY OF AREAS OCCUPIED BY BULGARIA SINCE 1939

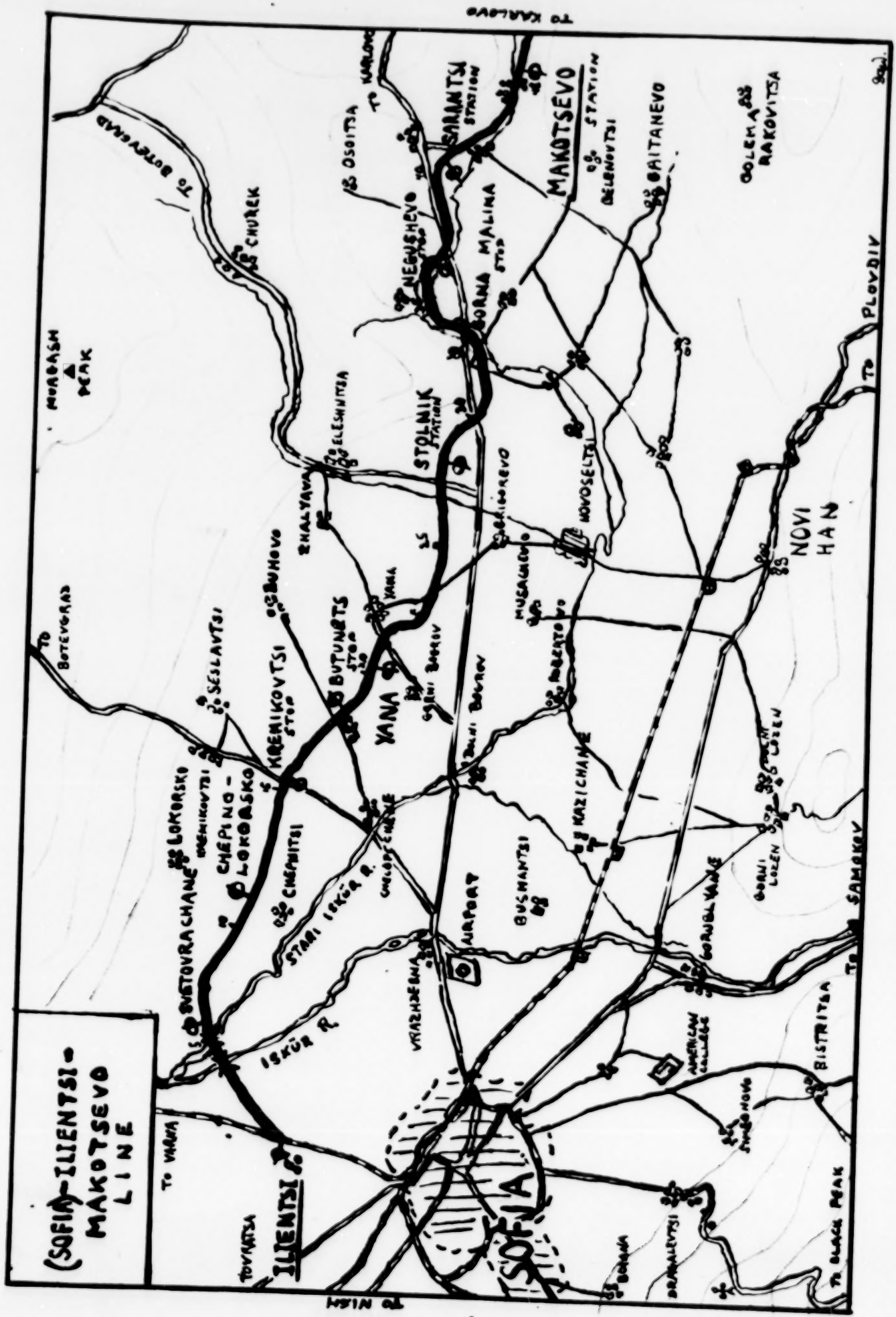
(OFFICIAL BULGARIAN NAMES USED IN OCCUPIED YUGOSLAV TERRITORY)

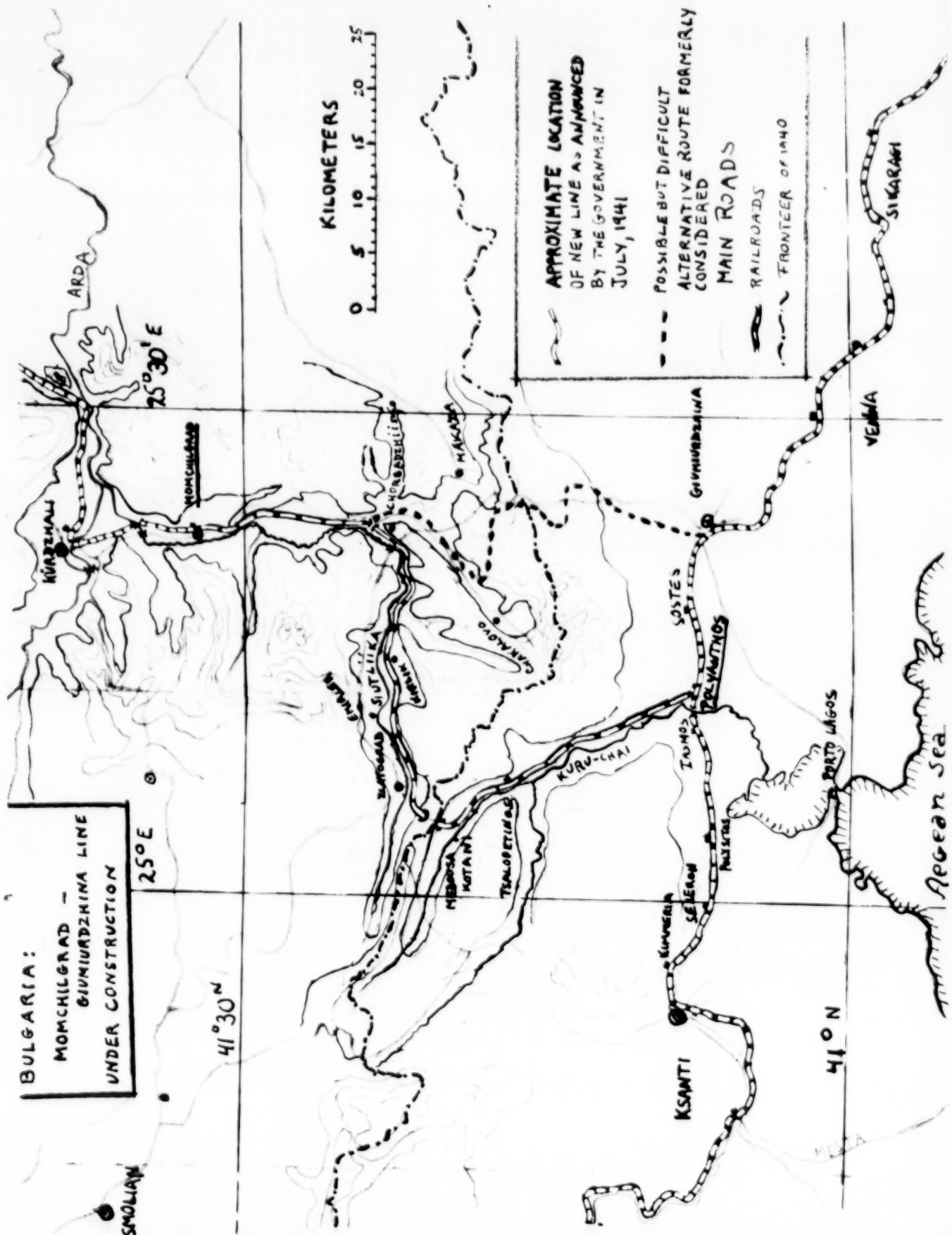
0 10 20 30 40 50
MILES
0 10 20 30 40 50
KILOMETERS

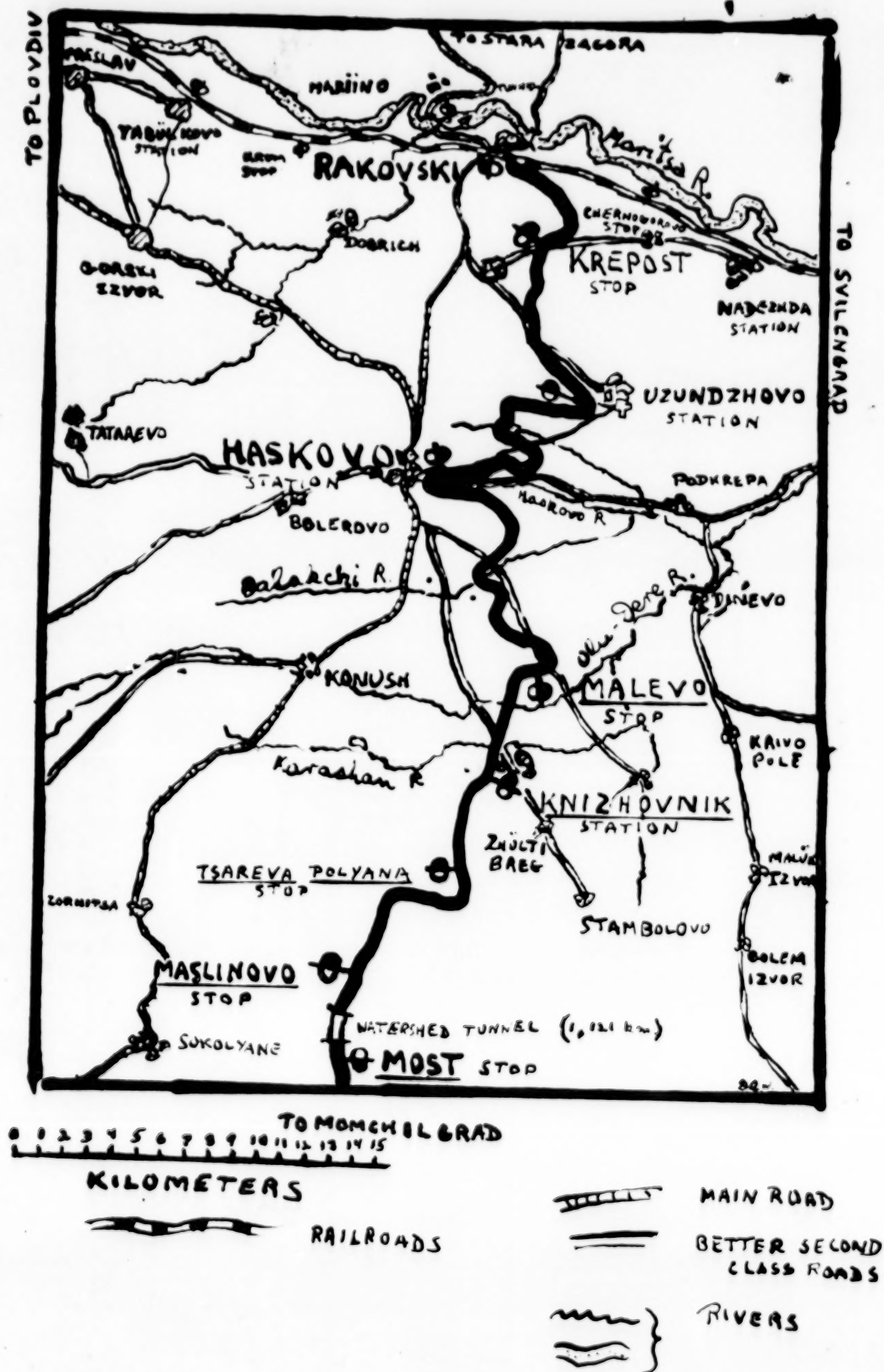




4a

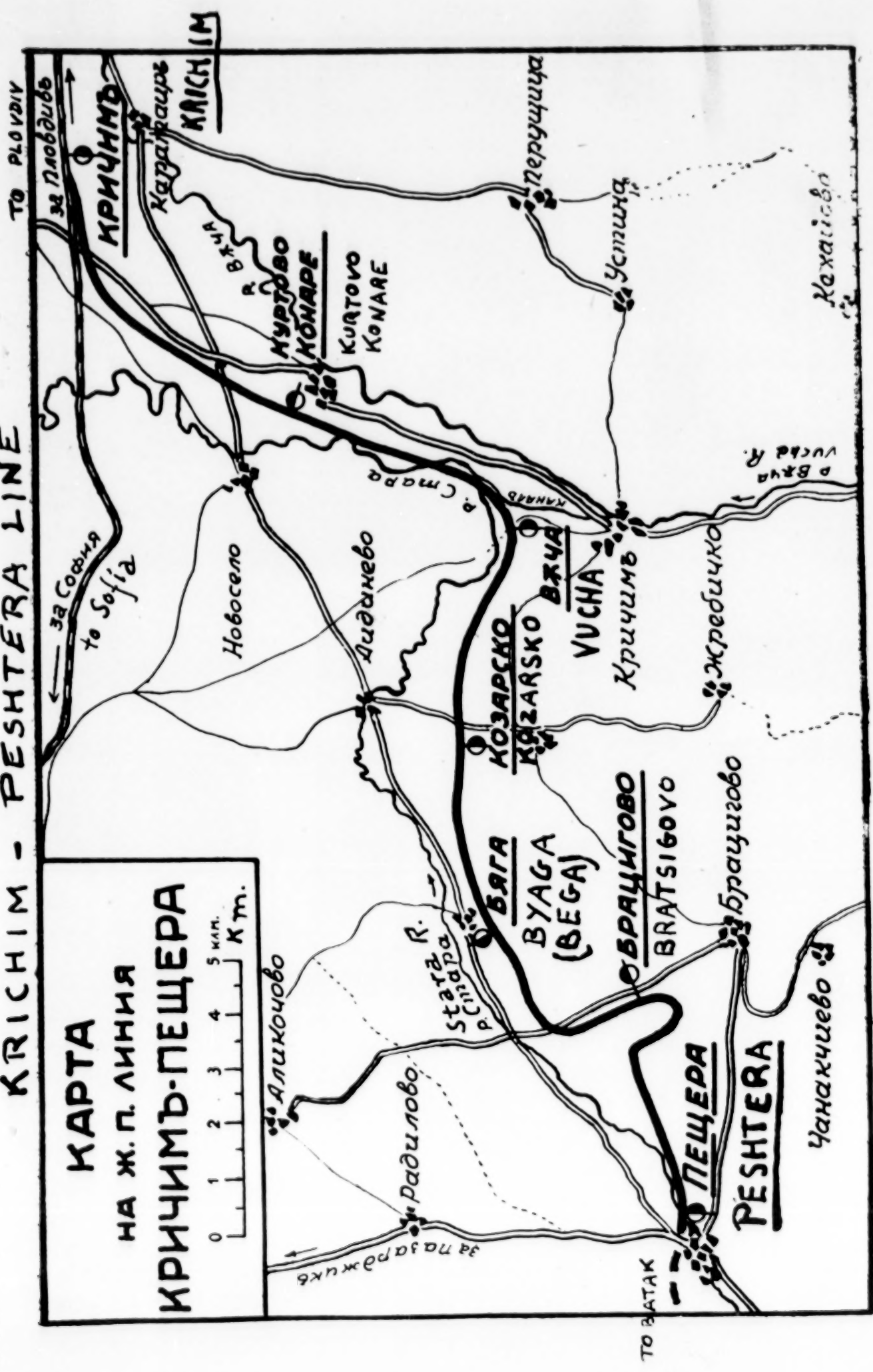
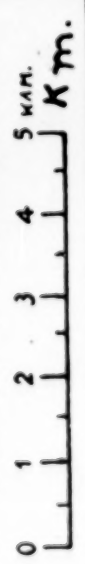




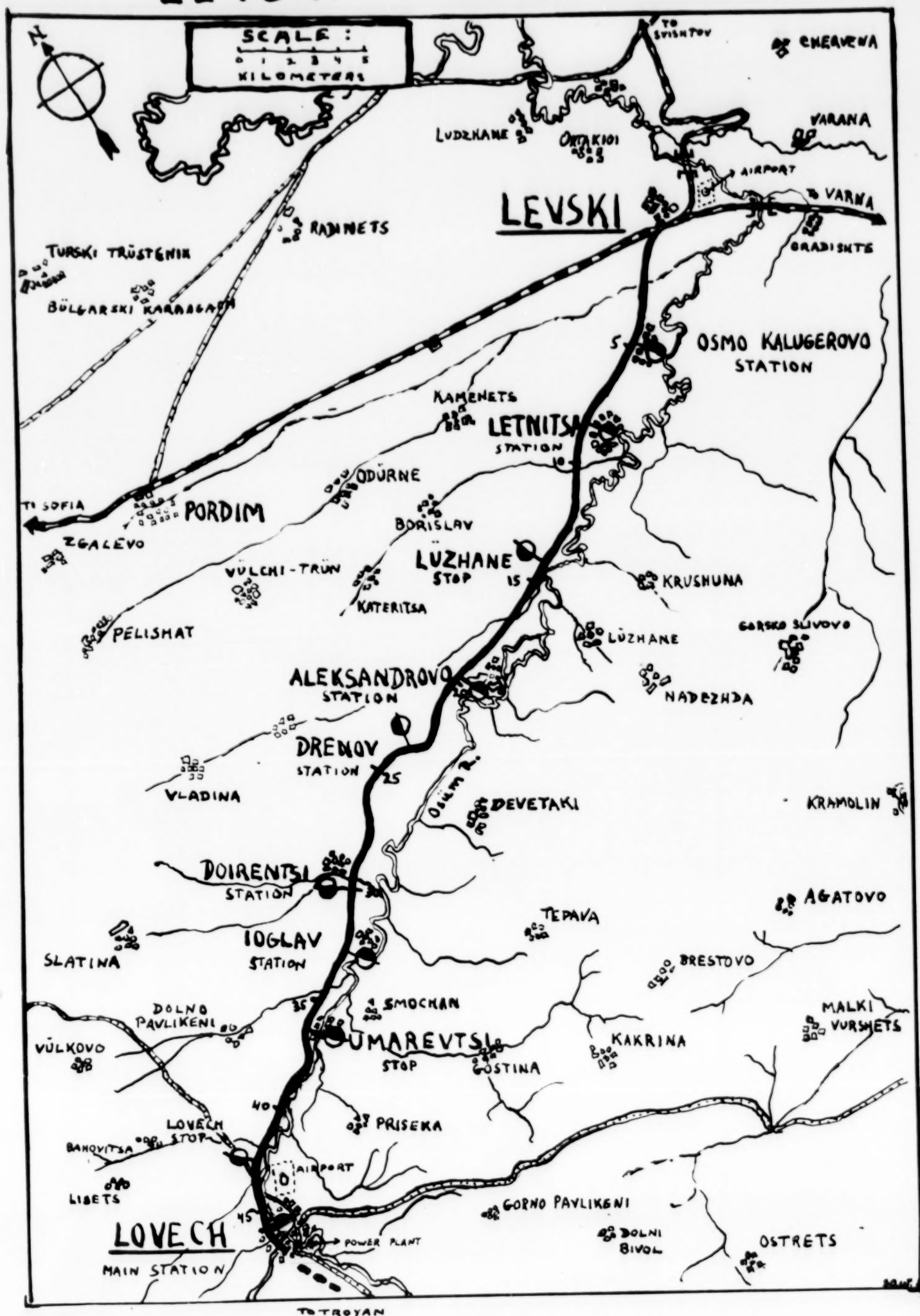


KRICHIM - PESHTERA LINE

КАРТА
НА Ж. П. ЛИНИЯ
КРИЧИМЪ-ПЕЩЕРА



LEVSKI — LOVECH LINE



CHEPINO - YAKORUDA SECTION OF THE 76cm SARANIOVO - ISTOK LINE

